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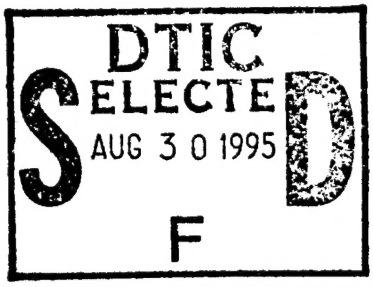
June 1995

US Army Corps of Engineers
Waterways Experiment Station

Index and Bulk Parameters for Frequency-Direction Spectra Measured at CERC Field Research Facility, September 1993 to May 1994

by Charles E. Long, Judy H. Roughton



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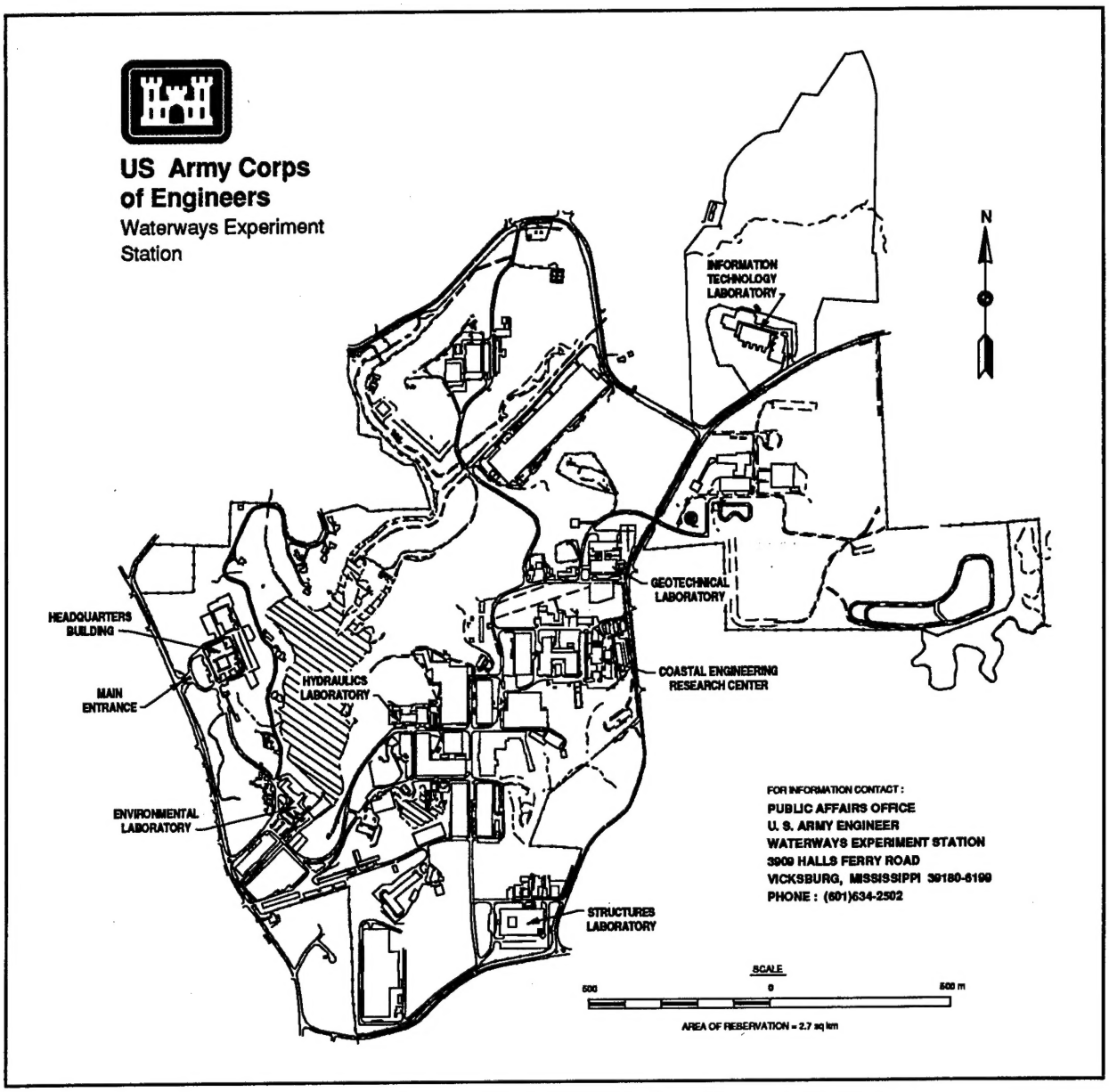

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Contents

Preface

This report indexes parameters of and describes means of access to a series of frequency-direction spectral observations made with a 16-element, high-resolution directional wave gauge at the Field Research Facility (FRF) of the U.S. Army Engineer Waterways Experiment Station (WES). The work was motivated by a paucity of observations of directionally distributed wave energy, which has hindered understanding and modeling of the nearshore processes that affect coastal engineering projects. This effort was authorized by Headquarters, U.S. Army Corps of Engineers (HQUSACE), under Civil Works Coastal Flooding Program Research Work Unit 32484, "Directionality of Waves in Shallow Water." Funds were provided through the Coastal Engineering Research Center (CERC), WES, under the program management of Ms. Carolyn M. Holmes, CERC. Messrs. John H. Lockhart, Jr., Charles Chesnutt, Barry W. Holliday, and John F. C. Sanda were HQUSACE Technical Monitors.

This summary report was prepared by Dr. Charles E. Long using data processed and archived with help from Ms. Judy H. Roughton at the FRF site near Duck, NC. Work was performed under the direct supervision of Mr. William A. Birkemeier, Chief, FRF, and Mr. Thomas W. Richardson, Chief, Engineering Development Division, CERC; and under the general supervision of Dr. James R. Houston and Mr. Charles C. Calhoun, Jr., Director and Assistant Director, CERC, respectively.

The directional wave gauge and its data processing software were designed by Dr. Joan M. Oltman-Shay while at Oregon State University working through an Intergovernmental Personnel Agreement. The directional wave gauge was physically maintained with diver coordination by Messrs. Michael W. Leffler and C. Ray Townsend III, FRF, and logistical support by Mr. Brian L. Scarborough, FRF. Gauge calibration was maintained by Messrs. Kent K. Hathaway and Paul R. Hodges, FRF. Acquisition, monitoring, and storage of raw data were done by Mr. Clifford F. Baron, FRF.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Bruce K. Howard, EN.

1 Introduction

Wind waves are among the dominant forcing mechanisms in all coastal processes. Estimation of wave forces for engineering design requires knowledge of sea state, which is described, at a minimum, by an amplitude, a frequency, and a direction for each component of a wave field. Historically, there have been many observations of wave amplitude and frequency, but very few detailed observations of wave direction, due primarily to additional technical requirements in making such measurements. This represents a distinct and very important void in the knowledge required for comprehensive engineering design.

To begin to alleviate this dearth of knowledge, the Field Research Facility (FRF) of the U.S. Army Engineer Waterways Experiment Station, installed a high-resolution, directional wave gauge for long-term observations of the nearshore incident directional wave climate at its site near Duck, NC (Figure 1). The original gauge, consisting of an alongshore linear array of nine pressure gauges, was installed in September 1986. In September 1990, an additional six gauges with a cross-shore alignment were incorporated, making a fifteen-element, two-dimensional spatial array for estimating wave energy propagating in all directions.

Data thus obtained, which take the form of wave frequency-direction spectra, are intended for use by the broadest possible group of researchers and application engineers, and have been archived in a simple database. This report simplifies data dissemination by indexing and describing means of access to the set of observations collected from September 1993 to June 1994, part of the eighth year of deployment. Indexes for the first 7 years of deployment are reported by Long (1991a, 1991b), Long and Smith (1993, 1994), Long and Atmadja (1994), Long and Pemberton (1994), and Long and Roughton (1994).

The main text of this document describes and clarifies the substantial information contained in the appendixes. Brief overviews are given of the measurement site, instrumentation, data collection, and method of directional spectral estimation. These subjects are described in greater detail in other publications, to which the reader is referred. Following the overviews is a description of the archived frequency-direction spectra and some characterizing bulk parameters that can be derived from them. Appendix A is a listing of these characterizing parameters and is intended to be used as a catalog of

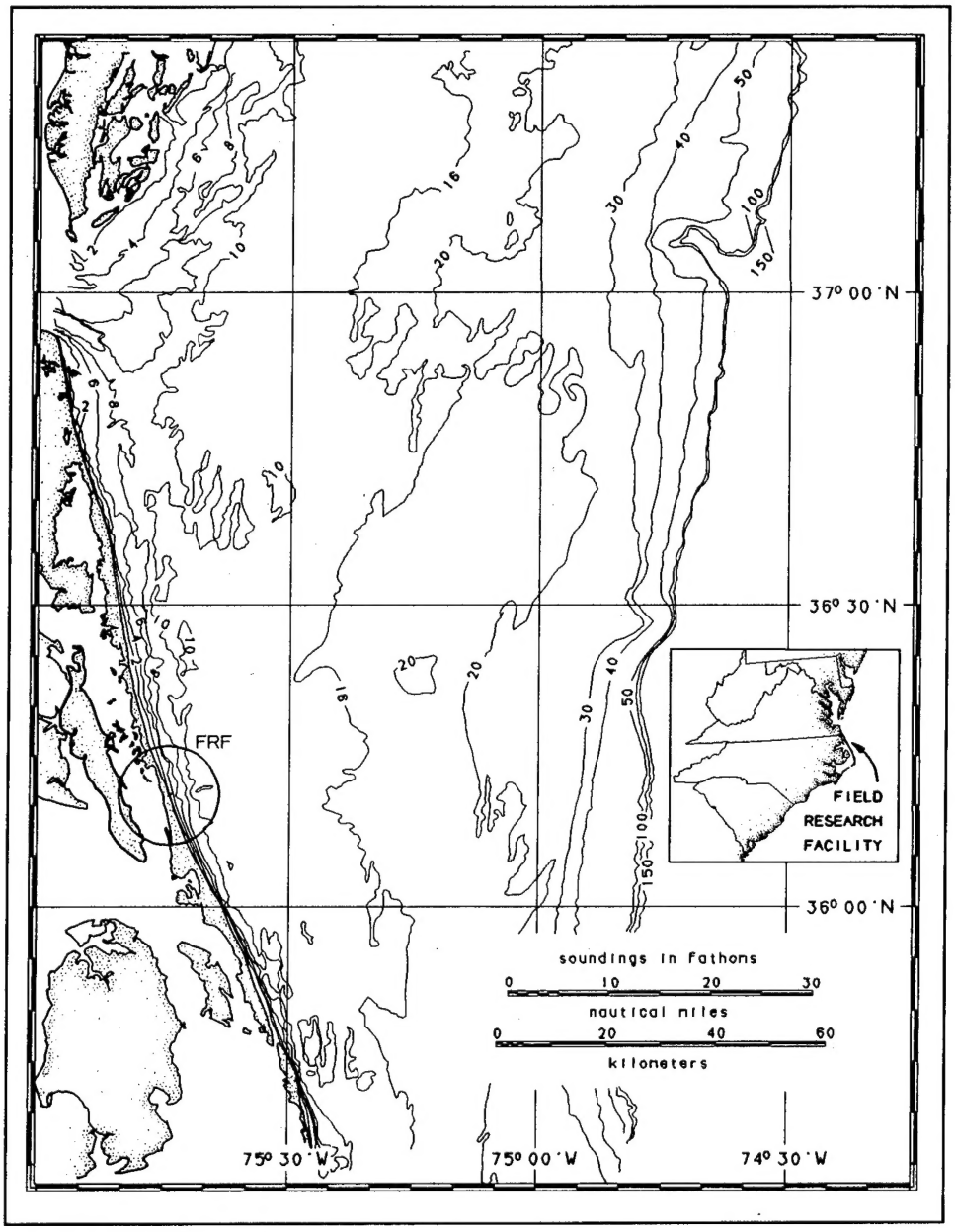

Figure 1. Location and offshore bathymetry of the FRF

the set of spectra. Appendix B contains graphs of time series of some of these parameters as a pictorial augmentation of the information in Appendix A. Appendix C illustrates a FORTRAN computer program that can be used to read archived data, of which a sample listing is given in Appendix D.

2 Field Research Facility

As shown in Figure 1, the FRF is located on the barrier island chain of coastal North Carolina. A detailed description of the layout, function, and capabilities of the FRF is given by Birkemeier et al. (1985). Of particular relevance to directional wave studies are the wave-steering bathymetry and wave-generating winds.

Bathymetry

The coastline in the vicinity of the FRF is nearly straight for several tens of kilometers north and south (Figure 1). It is oriented such that a shore-normal line (directed seaward) is very nearly 70 deg from true north. Waves and onshore winds can approach this site along an easterly 180-deg arc from 340 to 160 deg true. The adjacent continental shelf is wide, relatively shallow, and of somewhat complex bathymetry. The direction of nearest approach of the 100-m (328-ft) isobath, which indicates the shelf break, is 10 to 15 deg south of east. On this azimuth, the shelf break is about 80 km (43 n.m.) distant. A typical bottom slope for the shelf is 0.001, but this is interrupted by numerous features of 1- to 10-km (0.5- to 5.4-n.m.) horizontal scales and 10-m (33-ft) vertical scales scattered irregularly across the shelf.

Within a few kilometers of the FRF, the offshore bathymetry is more regular, with isobaths nearly shore-parallel and a bottom slope of about 0.002 (Figure 2). Some irregularities exist. Within about 300 m (984 ft) of the shore, there exists a complex and mobile bar system (Birkemeier 1984) that is strongly influenced by nearshore waves and currents. These processes have also created some irregular bathymetry in the vicinity of the 600-m-long (1,970-ft-long) FRF research pier (Miller, Birkemeier, and DeWall 1983).

Wave-Generating Winds

The site is subject to a variety of climates, which gives rise to a diverse set of directional wave conditions. Primary sources of high-energy waves are winds associated with hurricanes and frontal passages. Though no hurricanes passed directly over the FRF during the period covered by this report, one (Emily from 31 August to 1 September 1993) passed near enough that significant wave energy could be measured at the FRF. Unfortunately, the directional array of gauges was disabled for a major overhaul from 12 August to

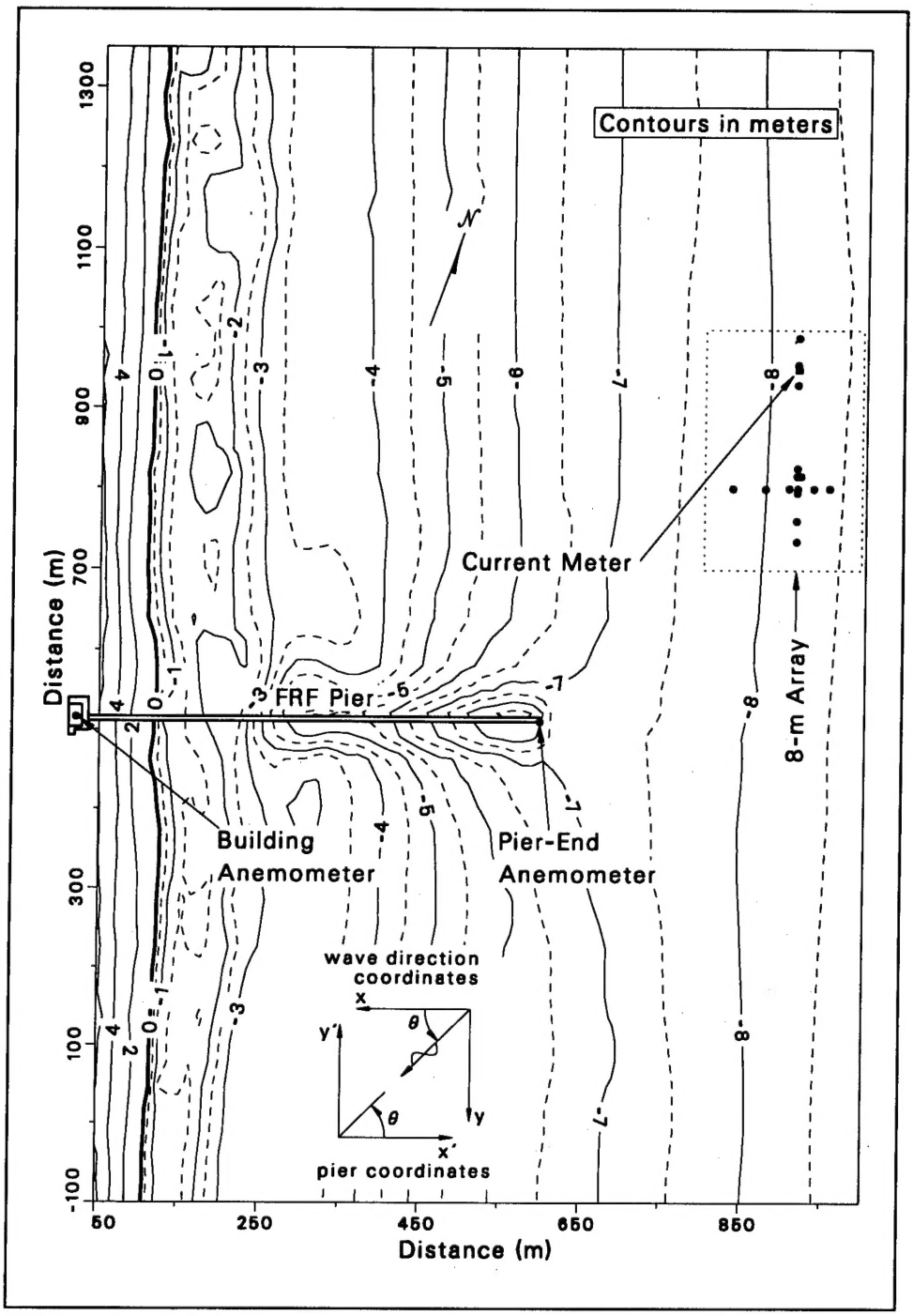

Figure 2. FRF nearshore bathymetry and coordinate system

23 September 1993, and so was not functioning during the passage of Hurricane Emily. Low-pressure weather fronts, of which several crossed the FRF site during this reporting period, were typically oriented northeast-southwest, with strong wave-generating winds coming from the northeast.

For additional information, the National Oceanic and Atmospheric Administration daily weather maps (U.S. Department of Commerce 1993, 1994)

contain large-scale depictions of weather systems passing the FRF site during this collection period. Detailed, quantitative descriptions of the climate at the FRF, as determined from its arsenal of instrumentation, are given in a series of annual reports, of which those by Leffler et al. (1992, 1993) are examples.

3 Instrumentation

The primary instrument in this study is a high-resolution directional wave gauge. It consists of two parts. The first is a spatial array of sensors that sample sea-surface displacement at several points in (horizontal) space. The second, described in the following section on data processing, is the mathematical treatment of these data to obtain estimates of wave directionality.

The FRF array consists of 15 pressure gauges mounted approximately 0.5 m (1.6 ft) off the bottom in the vicinity of the 8-m (26-ft) isobath about 900 m (2,953 ft) offshore and to the north of the research pier (Figure 2). Its location satisfies three constraints. First, it is generally outside the surf zone so that linear wave theory is applicable in data processing. Second, it is in water shallow enough that signals from 3-sec waves, the shortest periods of interest here, are detectable above background noise at the bottom-mounted gauges. Third, it is located away from the irregular isobaths around the pier and in the nearshore bar system, which helps minimize bathymetrically induced inhomogeneities in the wave field.

Spacing between gauges in the array appears irregular in Figure 2 but, for the most part, corresponds to the array-design criterion posed by Davis and Regier (1977) that every gauge pair has a unique separation. Figure 3 is an enlarged view of the array layout and shows gauge spacing as well as the gauge naming scheme. A sixteenth pressure gauge (labelled T) in Figure 3 is part of a low-resolution directional wave gauge that also includes the current meter indicated in Figure 2. Data from gauge T are included in error checking procedures, and were available as backup data in the event of failure of certain other gauges, but were not used as part of the high-resolution array during this collection period.

The array geometry encompasses considerable ranges in both sizes and numbers of gauge separations. Minimum gauge spacing is 5 m (16.4 ft) in both the alongshore and cross-shore directions. Maximum spacing is 255 m (837 ft) in the alongshore direction and 120 m (394 ft) in the cross-shore direction. Intermediate gauge spacings are in multiples of 5 m (16.4 ft). With 15 gauges, there are 105 possible unique spacings. In the FRF array, 12 redundant spacings are intentionally left for ancillary examination of spatial homogeneity of the wave field, so that 93 unique spacings remain.

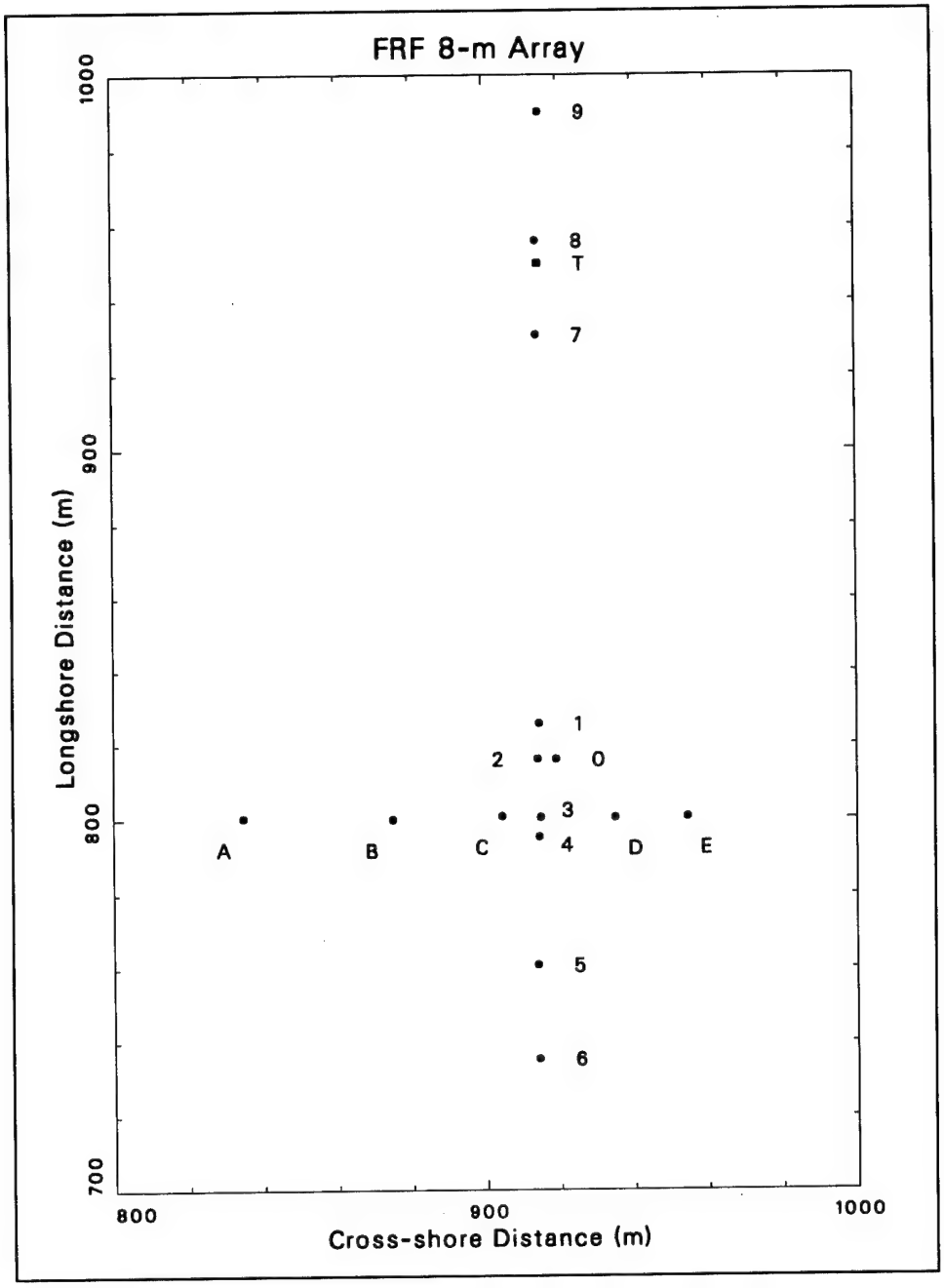

Figure 3. Spacing and numbering of linear array gauges

With the exception of gauge C, each pressure gauge is a Senso-Metric Model SP973(C), in which a piezo-electric strain gauge detects displacement of a pressure-sensitive diaphragm referenced to an evacuated cavity. Site calibrations indicate an accuracy of the pressure equivalent of ± 0.006 m (± 0.02 ft) of water for wave-induced fluctuations about a static water column height of 8 m (26 ft). Gauge C is a Paroscientific Model 245AT resonating quartz absolute pressure transducer. The manufacturer's stated accuracy of this gauge is the pressure equivalent of ± 0.003 m (± 0.01 ft) of water, which is about twice as accurate as the Senso-Metric gauges.

Voltage analogs of pressure signals are hard-wired through 10-Hz, fourth-order, Butterworth filters (primarily to eliminate 60-Hz noise) to an analog-to-digital signal converter, and then to a Digital Equipment Corporation VAXstation 4000 computer for data acquisition. Discretization of the full-scale signal to 11-bit binary form results in a digitization step of the equivalent of 0.007 m (0.023 ft) of water, which is nearly the same as gauge accuracy.

4 Data Collection

Signals from each of the pressure gauges were sampled at 2 Hz and stored digitally as records of 4,096 points (34 min 8 sec). A collection consisted of four such records, or 16,384 points (2 hr 16 min 32 sec) for each gauge. This procedure resulted in a total of 245,760 data points to produce one frequency-direction spectrum. Collections occurred eight times daily with starting times 0100, 0400, 0700, 1000, 1300, 1600, 1900 and 2200 hr Eastern Standard Time (EST). With this sampling pattern, the maximum possible number of collections is 2,920 in a 365-day year. Some collections are missed, however, because of necessary maintenance and repairs to the directional array and the data collection system.

During the 9-month period covered by this report, a total of 1,975 frequency-direction spectra (about 90 percent of the maximum possible) were obtained. A list of data collection start times for these observations is given in Appendix A. Appendix B contains time-series plots of spectral parameters with winds and currents as auxiliary environmental variables. Locations of reference anemometers and the current meter are shown in Figure 2. Note that wind vectors plotted in Appendix B are derived from the pier-end anemometer shown in Figure 2.

5 Data Processing

Conversion of measured time series to estimates of frequency-direction spectra requires products of frequency spectral estimates from the gauges in the array. For final results to be accurate, raw input data must be of exceptionally high quality so that spiky or drifty data from one gauge do not contaminate products of results from the other gauges. Hence, the procedure for data processing is to check raw data for errors before estimating frequency-direction spectra. Some bulk parameters can then be computed to characterize results.

Error Checking

Because multiple gauges were deployed in what was assumed to be a uniform sea, certain statistical properties of raw data from each of the set of gauges should be identical. One such property is the frequency spectrum $S(f)$ (where f is frequency)[1] of raw (not surface-corrected) pressure signals. Under the ideal circumstances of constant water depth, uniform gauge elevation from the bottom, and no statistical noise, frequency spectra from all gauges are identical in every detail. Though these circumstances are not met exactly in the FRF system, they are approximated sufficiently closely that an intercomparison of the frequency spectra from the array of gauges is an excellent method for identifying erroneous data records.

A convenient way to effect such an intercomparison is to overplot frequency spectra from all the gauges on a single graph. Wind wave signals attenuate with depth so that, in accordance with linearized wave theory, very little direct wind wave energy is expected in the frequency range from about 0.4 Hz out to the sampling Nyquist frequency (1.0 Hz for normal FRF sampling). Spectra in this frequency band should primarily indicate system noise, which should be about the same for all gauges of like kind, and consistent in time for all gauges. Excessively spiky data from one gauge appears as an increased noise level relative to other gauges. Strong low-frequency drifts in data from one gauge appear either as deviations in the low-frequency part of the spectrum or as varying mean values from segment to segment through a data record. In the pass band of wind wave frequencies for which directional

[1] For convenience, symbols and abbreviations are listed in the notation (Appendix E).

estimates are computed (0.04 to 0.32 Hz for these data), one expects the frequency spectra to be nearly identical. A malfunctioning gauge is clearly identifiable in this type of intercomparison.

Figure 4 is an example of one set of overplotted frequency spectra. Semi-logarithmic coordinates have been used to emphasize the behavior of the low-energy, high-frequency spectral tails. All pressure gauge signals have been converted to equivalent heights of a static water column for convenience in interpretation. As can be seen in Figure 4, spectra in the wind wave frequency pass band are very nearly alike, indicating that all gauges are functioning reasonably well. The noise floor at high frequencies is very low relative to the wind wave signal and is nearly uniform for all but two gauges. The two exceptions are the spare gauge (gauge T in Figure 3), for which the signal followed (at the time of the collection shown) a slightly different and intrinsically noisier electronic path to the data collection computer, and the Paroscientific gauge (gauge C in Figure 3), which had an inherently quieter background noise level than that of the other gauges.

The inset graph in Figure 4 reveals information about gauge mean values. Data records were divided into 15 half-overlapping segments having a duration of 17 min 4 sec. Segment mean values were then computed for each gauge. Ideally, when gauge means are corrected for the depth of water in which they were deployed and for the elevation of the gauge from the ocean bottom, they would all give a measure of mean water level (tidal elevation, barometric overpressure, and any wind- or wave-induced setup), which should be the same for all locations in the array for that segment of time. Experience has shown that the Senso-Metric gauges used in the array tend to have a modest mean drift over time scales of months. For the analysis used to produce this report, an estimate of true water depth was computed by finding the median of the set of corrected gauge means for each segment. The inset in Figure 4 shows the deviation of individual gauge means from this median value as a function of segment number, and indicates, for this example, mean depth errors ranging from about 0.15 m (0.49 ft) low to about 0.15 m (0.49 ft) high. By referencing all gauges to the median mean depth, potential errors in surface correcting the wind wave part of the signal are reduced.

The triangular symbol in the inset in Figure 4 shows the deviation of the median mean depth from still-water level (based on the 1929 National Geodetic Vertical Datum) as a function of segment number. The resulting curve represents the combined effects of tide, setup, and barometric overpressure. The square symbol in the inset in Figure 4 is the deviation of barometric pressure from one standard atmosphere in units of meters of sea water as a function of segment number. This curve indicates the magnitude of atmospheric pressure on pressure measurements of mean water level. This effect is removed from pressure gauge means by subtracting the excess of atmospheric pressure over one standard atmosphere from each of the gauge means.

It is noted that the present method of error checking is different from that used for results reported for the first 4 years of array analysis (Long 1991a, 1991b; Long and Smith 1993, 1994). The older method relied on moments

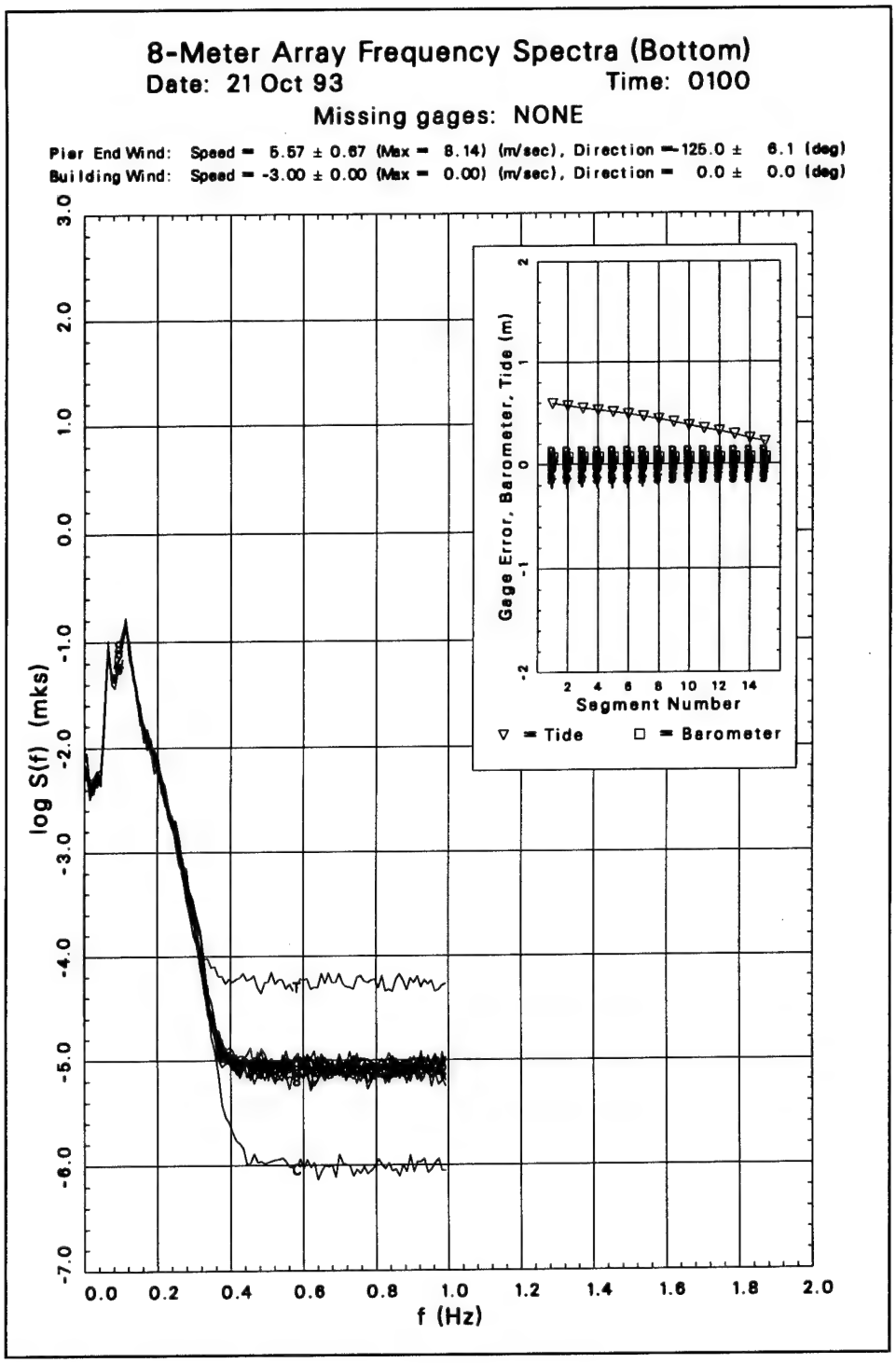

Figure 4. Example of overplotted frequency spectra

and extremal characteristics derived from data time series in the time domain. The present method casts the data in the frequency domain, but is sensitive to the same underlying characteristics that would flag data as suspect in the older method, and is much easier to use. In both methods, if a gauge demonstrated properties that deviated too much from properties of the other gauges, it was

flagged as being suspect, and the data were then further examined by hand to ensure that the flagging procedure had indeed identified a malfunctioning gauge.

If a gauge malfunctioned, it was not used in further analysis. The analysis programs were written so that data from a subset of gauges could be analyzed. A few gauges could then be lost without seriously compromising the results. Using fewer gauges yields a somewhat reduced directional resolution. Some gauges are more critical than others. If any of the gauge pairs with 5-m (16.4-ft) spacings are lost, results become invalid at high frequencies due to aliasing. In these cases, directional analysis was truncated at a lower high-frequency limit (generally 0.24 Hz instead of the normal 0.32 Hz). As discussed in the next section, there are additional reasons for eliminating gauges from directional wave estimation at some frequencies in a spectrum. However, fewer than four gauges are never used for any frequency.

To keep track of the set of functioning and not otherwise eliminated gauges, a parameter called the *gauge pattern* was created and stored with the results for each frequency in archived directional spectra. The gauge pattern is a 16-place character string that represents which of the possible gauges (the 15 array gauges plus the optional gauge T) were used to compute a directional spectrum at a particular frequency. The string contains the identifying characters (based on the gauge identification scheme shown in Figure 3) of gauges that were used in analysis followed by blank characters (if any) to fill out the string. This parameter can be of use in later analyses for assessing the directional resolving ability of a particular sub-array of gauges. This definition of gauge pattern differs from that used for the first 4 years of archived data, but the automated analysis algorithm was modified in September 1990 to be more dynamic in gauge selection (as described in the next section), and so necessitated this change.

Frequency-Direction Spectra

Two types of spectra

Data from the array of gauges are processed as two separate entities, both of which are frequency-direction spectra, but having different properties. One of the entities is a frequency-direction spectrum using only the original nine gauges (gauges 1, 2, 3, 4, 5, 6, 7, 8, and 9 in Figure 3) of the alongshore linear array. Directional spectra from this set of gauges are referred to as *linear array* results. The other entity is a frequency-direction spectrum using all gauges. Directional spectral estimates using all gauges are called *8-m array* or *full array* results.

There are several reasons for this distinction. One is that the database for the first 4 years of this study is based on results from the linear array. Comparisons of results over the full duration of the study and the accumulation of climatological statistics require a continued analysis of the linear array as a unique entity. A shortcoming of the linear array is that it cannot distinguish seaward-propagating waves from incident waves. In processing linear array

data, it must be assumed that all wave energy is incident, which does not allow for the possibility of reflections from the nearshore. This problem is overcome by using the full array, which includes gauges at cross-shore locations (gauges 0, A, B, C, D, and E in Figure 3) off the line of the linear array. The full array can detect wave energy propagating in all directions, and so can be used to estimate the amount of wave energy reflected (and otherwise propagating) from the nearshore.

Ideally, the full array would be adequate for all directional spectral estimates. However, the analysis algorithm for the full array is based on the assumption that waves are propagating through water of constant depth. In fact, the depth changes by about 0.8 m (2.6 ft) over the cross-shore breadth of the array (from gauge E to gauge A), or roughly 10 percent of the total depth. Intermediate- and shallow-water waves transform, largely by refraction, as they propagate through water of changing depth. This transformation introduces a slight shift in the phase difference between waves at two cross-shore locations relative to the phase difference of waves that are not transformed. Directional spectral estimates depend critically on accurate estimates of phase difference, and the effect of transforming waves, though slight, is to introduce an increased spread in the directional distribution of wave energy, especially for waves at high angles of attack. An optical analogy is a camera with a poorly ground lens that will focus clearly at the center but is slightly blurred at the edges.

The linear array does not have this blurring effect because waves have the proper phase difference as they cross a line of constant depth. Consequently, directional spectral estimates from the linear array are better resolved in their detailed structure. Because of this better resolution, linear array results are used for all characterizing parameters except reflection coefficients in this report. Though full array results are somewhat blurred, reflection coefficients are based on total energy in 180-deg arcs of direction, and so are less sensitive to a lack of detailed resolution than are other parameters like peak direction and directional spread. Note, however, that both linear array and full array spectra and associated parameters are computed, archived, and available through the mechanisms described in this report for all collections listed in Appendix A.

Spectral estimation

Estimation of the frequency-direction spectrum is done in five parts. First, a working gauge set is identified. Second, time series of pressure data from each of the working gauges are Fourier transformed to the frequency domain. Third, these transforms are converted to sea-surface displacement transforms. Fourth, cross spectra of sea-surface displacement are computed between all unique gauge pairs for each frequency. Finally, an estimate is made of a directional distribution of wave energy that corresponds to the computed spatial variation in cross-spectral density for each frequency.

The choice of gauges to be used in a frequency-direction spectrum at a particular frequency depends on available gauges after error checking

(described previously), the wavelengths of the waves to be resolved, and somewhat on the nature of the directional distribution of wave energy being estimated. Ocean wave signals at a given frequency tend to become uncorrelated over distances of a few wavelengths. Cross spectra of signals from two gauges of high-frequency (short wavelength) waves are reduced to noise if the gauge separation is too great. Conversely, cross spectra of signals from two closely spaced gauges do not yield a great deal of information about very long waves because the two signals are almost identical. Because of these characteristics of ocean waves, sub-arrays of both the linear and 8-m arrays are defined so that minimum gauge spacing and maximum array extent are tuned to ranges of wind wave frequencies, and directional spectra are estimated from the gauges in these sub-arrays.

An additional constraint on gauge usage is based on the observation by Davis and Regier (1977) that occasionally the directional spectrum is of sufficiently simple shape that some of the cross-spectral information becomes redundant, meaning that too many gauges (or, perhaps, gauges in less than ideal locations) have been employed in the directional estimate. An indication of this condition is that the matrix of cross-spectral estimates becomes singular in the mathematical sense. When this occurs in the course of a computation, the procedure is to eliminate a gauge from the sub-array being used, and restart the computation. To avoid eliminating a critical gauge, an order for gauge elimination was established that retained gauges known to be important. Because this procedure occurred in automated processing, a complete gauge elimination pattern was defined, but if fewer than four gauges remained at any point in processing, the entire analysis was aborted for that collection.

Table 1 shows the wind wave frequency band sub-ranges, the sub-array of gauges to be used with each frequency sub-range, and the elimination order of gauges in each sub-array for the gauges of the linear array. A column under a gauge number that contains an integer indicates a gauge to be used for the frequency range shown in the left column. The integers in each row indicate the order in which gauges are to be eliminated. For example, in the next-to-highest frequency range of the original array ($0.14 < f \leq 0.19$ in Table 1), gauges 1, 2, 3, 4, 5, and 6 define the sub-array. In the event that a gauge

Table 1
Linear Array Gauge Usage

Frequency Range (Hz)	Gauge									
	1	2	3	4	5	6	7	8	9	T
$0.04 < f \leq 0.08$	5	1		7	4	6	8	2	3	
$0.08 < f \leq 0.14$	5	2	1	6	4	7	3			
$0.14 < f \leq 0.19$	5	6	1	4	3	2				
$0.19 < f \leq 0.32$	2	3	4	5	1					

must be eliminated, gauge 3 is eliminated first. If a second gauge must be eliminated, it is gauge 6, and so on, until the four-gauge limit is reached (if necessary). Table 2 shows the same type of information for the full array.

Because gauge set definition varies with frequency, and is somewhat data-adaptive in that some spectra require gauge elimination and others do not, it is important that a record be kept of the set of gauges used for each frequency in a collection analysis. That is the primary purpose of the gauge pattern parameter defined previously. The gauge pattern parameter is always kept with the archived results, and the limit of a minimum of four gauges for each directional estimate is never violated. Once the appropriate set of gauges has been identified, the subsequent analysis operations of Fourier transformation, surface correction, cross-spectral computation, and directional spectral estimation can proceed.

The Fourier transform is conventional. An 8,192-sec time series is divided into 15 half-overlapping segments of 1,024 sec. Segments are tapered with a

Table 2
8-m Array Gauge Usage

Frequency Range (Hz)	Gauge															
	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E	T
$0.04 < f \leq 0.08$	1	11			12	8	6	5	2		9	10	7	4	3	
$0.08 < f \leq 0.12$	5	7			10	11	2	1			3	6	8	9	4	
$0.12 < f \leq 0.21$	7	10	11	6	3	1				8		4	9	5	2	
$0.21 < f \leq 0.32$	3	5	7	6						4			2	1		

Kaiser-Bessel window (a modified Bessel function of the first kind, compensated uniformly for loss of variance due to windowing) and fast Fourier transformed. An intermediate-resolution transform is found by averaging the 15 transformed segments, frequency by frequency. Final transforms are found by then averaging results over 10 adjacent frequency bands. Final resolution bandwidth is 0.00976 Hz, and degrees of freedom are at least 150 (assuming eight contiguous segments and ignoring any gain from lapped segments). Transform estimates are retained for 29 frequency bands with band-center frequencies ranging from 0.044 to 0.318 Hz.

Conversion of pressure signals at depth to water-surface displacement is done through the linearized wave theory pressure response factor as described in the *Shore Protection Manual* (1984). After this conversion, complex cross spectra in the form of coincident and quadrature spectra are computed in the conventional way (Bendat and Piersol 1971, Jenkins and Watts 1968) between all unique gauge pairs for each frequency.

Conversion of cross-spectral patterns in lag space to directional spectra is done with the Iterative Maximum Likelihood Estimation algorithm derived and described by Pawka (1982, 1983). The algorithm is also described in application to data from heave-pitch-roll buoys by Oltman-Shay and Guza (1984), and Long (in preparation) gives a modestly expanded description of the algorithm for two-dimensional spatial arrays. Accuracy of directional estimates depends on frequency, with high-frequency waves (short wavelengths) being better resolved by an array of finite length. Tests with artificial data indicate that the FRF linear array generally can resolve the direction of a unidirectional wave train to within 5 deg and can distinguish two wave trains at the same frequency if their directions differ by at least 15 deg.

The algorithm used here employs discrete direction "bandwidths" or arcs of about 1 deg for all frequencies. Because this increment is finer than the resolution of any of the arrays, directional results were integrated over 2-deg arcs and renormalized with this arc width to create evenly spaced directional spectra at all frequencies. Because linear array results are valid only in the 180-deg arc representing seaward approach directions, dividing this range into 2-deg arcs results in 91 arc center directions with which to characterize discretely the directional distribution of wave energy from the linear array. The full array can detect wave energy from all directions, so results are represented in 181 directional bins of 2-deg width (the terminal bins are redundant).

The primary result of data processing is an estimate of the discrete frequency-direction spectrum $S(f_n, \theta_m)$, which represents the variance of sea-surface displacement per frequency resolution bandwidth df (= 0.00976 Hz) per direction resolution arc $d\theta$ (= 2 deg), where f_n is the n^{th} of $N = 29$ discrete frequencies and θ_m is the m^{th} of $M = 91$ (for the linear array) or 181 (for the full array) discrete directions. In this work, direction is considered to be the angle from which wave energy is coming, measured counterclockwise from shore-normal (Figure 2).

Numerical values of $S(f_n, \theta_m)$ can range over many orders of magnitude, depending on the amount of energy in a given frequency band and direction arc, and this can require space-consuming formats for archiving data. To simplify this problem, frequency-direction spectra are saved as directional distribution functions $D(f_n, \theta_m)$ defined by

$$D(f_n, \theta_m) = \frac{S(f_n, \theta_m)}{S(f_n)} \tag{1}$$

The directional distribution function has units of deg^{-1}, and its integral with respect to direction over all directions is unity.

The frequency spectrum $S(f_n)$ in Equation 1 represents the sum over all directions of sea-surface variance per frequency bandwidth and is defined in terms of the frequency-direction spectrum by

$$S(f_n) = \sum_{m=1}^{M} S(f_n, \theta_m)\, d\theta \tag{2}$$

where the variables on the right-hand side are defined above. Note that this is identical to a conventional frequency spectrum that would result from a time series of sea-surface displacements at a single point in space. Because it is an integral of the frequency-direction spectrum, it is called the integrated frequency spectrum.

A directional analog of the frequency spectrum is the integrated direction spectrum, found by summing the frequency-direction spectrum over all frequencies for a fixed-direction arc. It is computed from

$$S(\theta_m) = \sum_{n=1}^{N} S(f_n, \theta_m)\, df \tag{3}$$

Figures 5 and 6 show ways to display frequency-direction spectra and the corresponding integrated frequency and integrated direction spectra from the two types of array analysis for the same collection time. Figure 5 displays results from the linear array, with some characterizing parameters shown in the figure header. Note that energy is displayed only for incident waves (-90 deg $< \theta_m <$ 90 deg). Figure 6 shows results from the full array. The characterizing parameters derived from this spectral estimate are nearly the same as those for the linear array results in Figure 5, showing that the two estimates are consistent in this regard, as expected. In Figure 6, directional energy estimates cover a complete circle. The small lump centered near direction -170 deg, and spreading across -180 deg (or +180 deg) is an indication of reflected energy.

Bulk Parameters

Several parameters have been computed to characterize the observed spectra. There are five basic types of parameters: (a) characteristic wave height, (b) peak frequency (or its inverse, peak period), (c) peak direction, (d) directional spread, and (e) reflection coefficient. In this report, the first four of these parameters are computed from linear array results. The fifth is computed using results from the full array. Because there is more than one way to define some of these parameters, several alternate forms are presented here.

Characteristic wave height

Characteristic wave heights from spectral observations are most frequently given as H_{mo}, which is four times the standard deviation of sea-surface displacement. It can be determined from the volume under the frequency-direction spectrum by the equation

$$H_{mo}^2 = 16 \sum_{n=1}^{N} \sum_{m=1}^{M} S(f_n, \theta_m)\, df\, d\theta \tag{4}$$

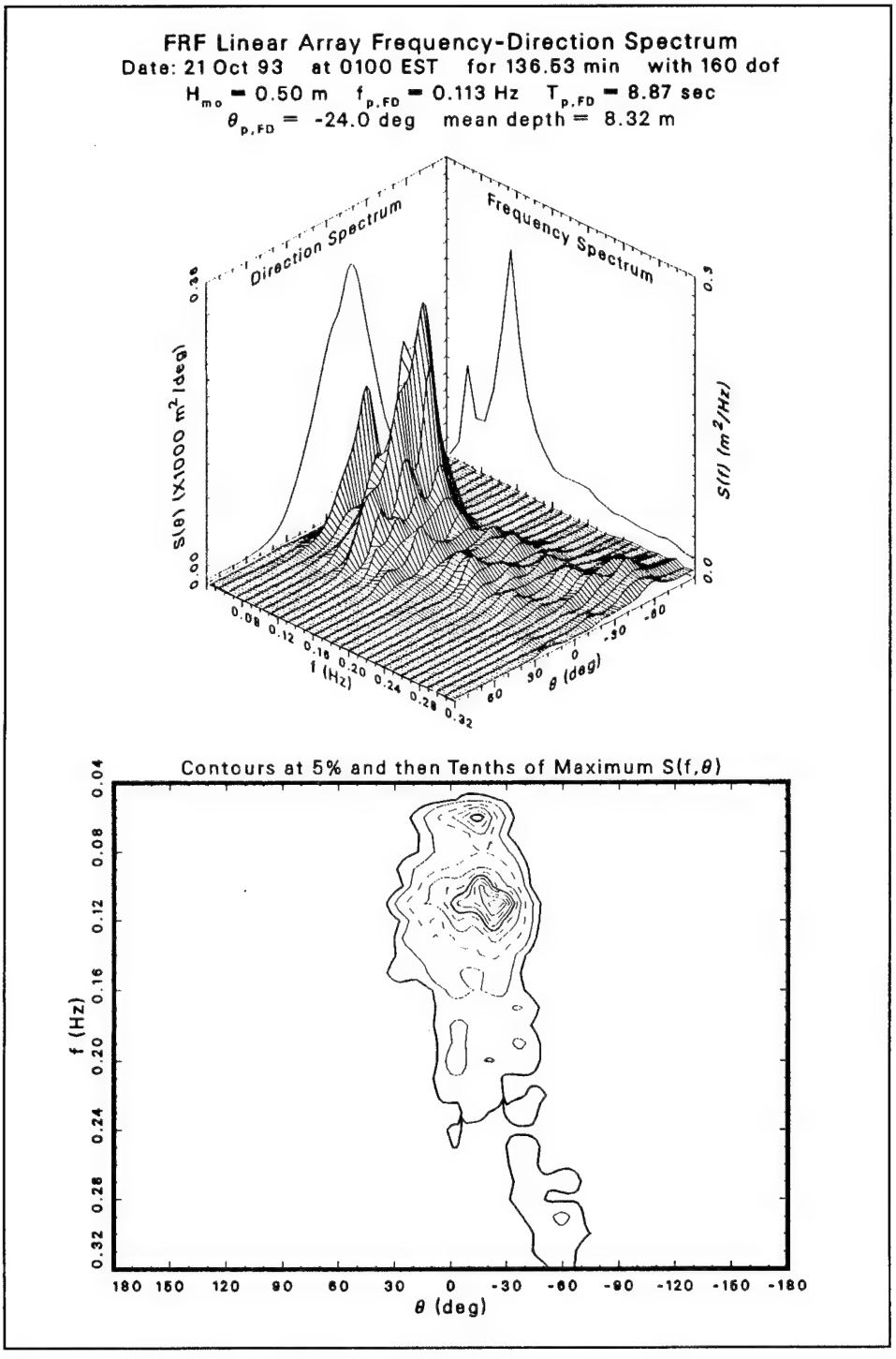

Figure 5. Example of a linear-array frequency-direction spectrum

It can also be found from the integrated frequency spectrum by

$$H_{mo}^2 = 16 \sum_{n=1}^{N} S(f_n)\, df \tag{5}$$

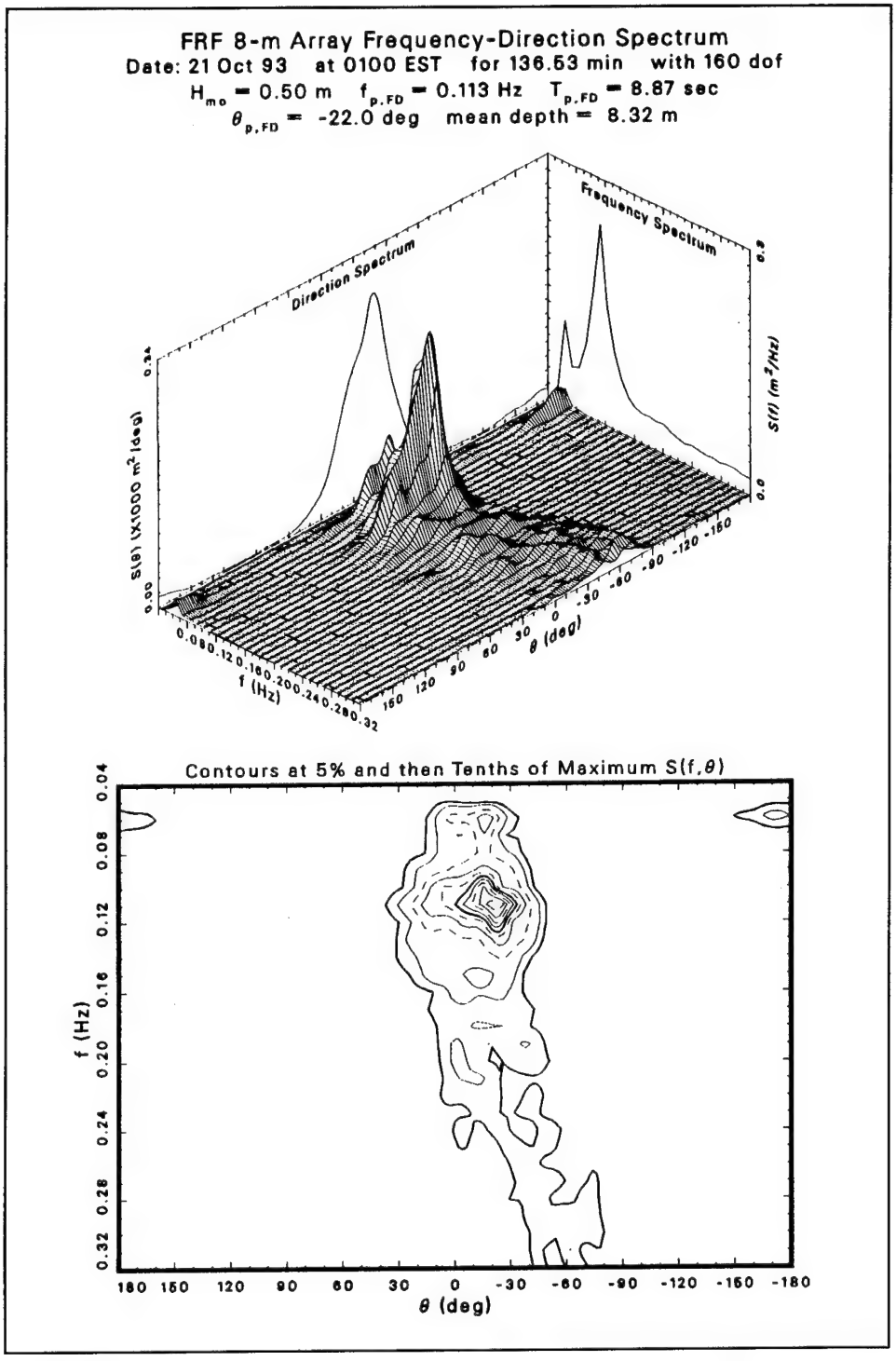

Figure 6. Example of a full-array frequency-direction spectrum

which is its more conventional definition, or from the integrated direction spectrum (Equation 3) by

$$H_{mo}^2 = 16 \sum_{m=1}^{M} S(\theta_m)\, d\theta \tag{6}$$

Peak frequency

Peak frequency, which has the generic notation f_p, can be defined in at least two ways. One way is to find the frequency (and direction) at which the frequency-direction spectrum is maximum. This peak frequency is denoted $f_{p,FD}$. Another way is to find the frequency at which the integrated frequency spectrum is maximum. This is the more conventional definition, because of the plethora of measured frequency spectra, and it is denoted $f_{p,IFS}$. The two peak frequencies may not be the same. If the directional distribution is broad at the frequency for which the integrated frequency spectrum is maximum, it is possible that another frequency, at which the frequency-direction spectrum has a narrow directional distribution, will denote the maximum of the frequency-direction spectrum.

Peak period

Peak period is the characteristic wave period associated with spectral peak frequency. Denoted generically by T_p, it is related to peak frequency by $T_p = 1/f_p$. Peak period from the frequency-direction spectrum is given by $T_{p,FD} = 1/f_{p,FD}$. Conventional peak period, derived from the integrated frequency spectrum, is given by $T_{p,IFS} = 1/f_{p,IFS}$.

Peak direction

Peak direction is the direction representing the most energy. Given the generic symbol θ_p, it, too, can be defined in several ways. One peak direction can be defined from the maximum of the frequency-direction spectrum. It is denoted by $\theta_{p,FD}$. Another peak direction can be associated with the maximum of the integrated direction spectrum, defined previously. This peak direction is denoted $\theta_{p,IDS}$. It can differ from $\theta_{p,FD}$ if energy in the frequency-direction spectrum is centered at different directions for different frequencies. This condition tends to smear energy along the direction axis in the integrated direction spectrum, thereby shifting the peak relative to the peak of the frequency-direction spectrum. A third measure of peak direction is a weighted average peak direction defined by

$$\theta_{p,SW} = \frac{1}{\left(\frac{1}{4}H_{mo}\right)^2} \sum_{n=1}^{N} S(f_n)\, \theta_{p,n} \tag{7}$$

where

$\theta_{p,n}$ = peak direction of the directional distribution at the n^{th} frequency of the frequency-direction spectrum

$S(f_n)$ = integrated frequency spectrum from Equation 2

and H_{mo} is defined by Equation 4. This definition gives higher weights to the more energetic peak directions but does not rely on the single distribution with the most energy.

Directional spread

A fourth type of characteristic parameter is directional spread. This parameter, denoted generically as $\Delta\theta$, gives a measure of the range of directions from which some significant fraction of energy is propagating. The basic definition used here is the arc subtended by the middle two quartiles of a directional distribution. As illustrated in Figure 7, the directional distribution function $D(f_n, \theta_m)$ for a particular frequency f_n can be integrated from one bounding direction (here the shore-parallel direction at +90 deg) to some arbitrary direction θ_j to make a cumulative distribution function $I(f_n, \theta_j)$. The formal definition is

$$I(f_n, \theta_j) = \sum_{m=1}^{j} D(f_n, \theta_m)\, d\theta \tag{8}$$

where j is the index of a discrete angle bin. The three quartile directions, called $\theta_{25\%,n}$, $\theta_{50\%,n}$, and $\theta_{75\%,n}$, respectively, satisfy the equations

$$I(f_n, \theta_{25\%,n}) = 0.25 \tag{9}$$

$$I(f_n, \theta_{50\%,n}) = 0.50 \tag{10}$$

$$I(f_n, \theta_{75\%,n}) = 0.75 \tag{11}$$

A directional spread parameter for the n^{th} frequency is defined by

$$\Delta\theta_n = \theta_{25\%,n} - \theta_{75\%,n} \tag{12}$$

If Equation 12 is applied at the frequency where the frequency-direction spectrum is maximum, a measure of directional spread at the peak of the frequency-direction spectrum is obtained. This parameter is denoted $\Delta\theta_{FDP}$. If, instead of a directional distribution function at a single frequency, the normalized integrated direction spectrum is used in the set of Equations 8 to 12, a measure of bulk directional spread is obtained. This parameter is given the symbol $\Delta\theta_{IDS}$. A third measure of directional spread is found from a spectrally weighted average of the spreads at each frequency. Denoted as $\Delta\theta_{SW}$, this parameter is found from

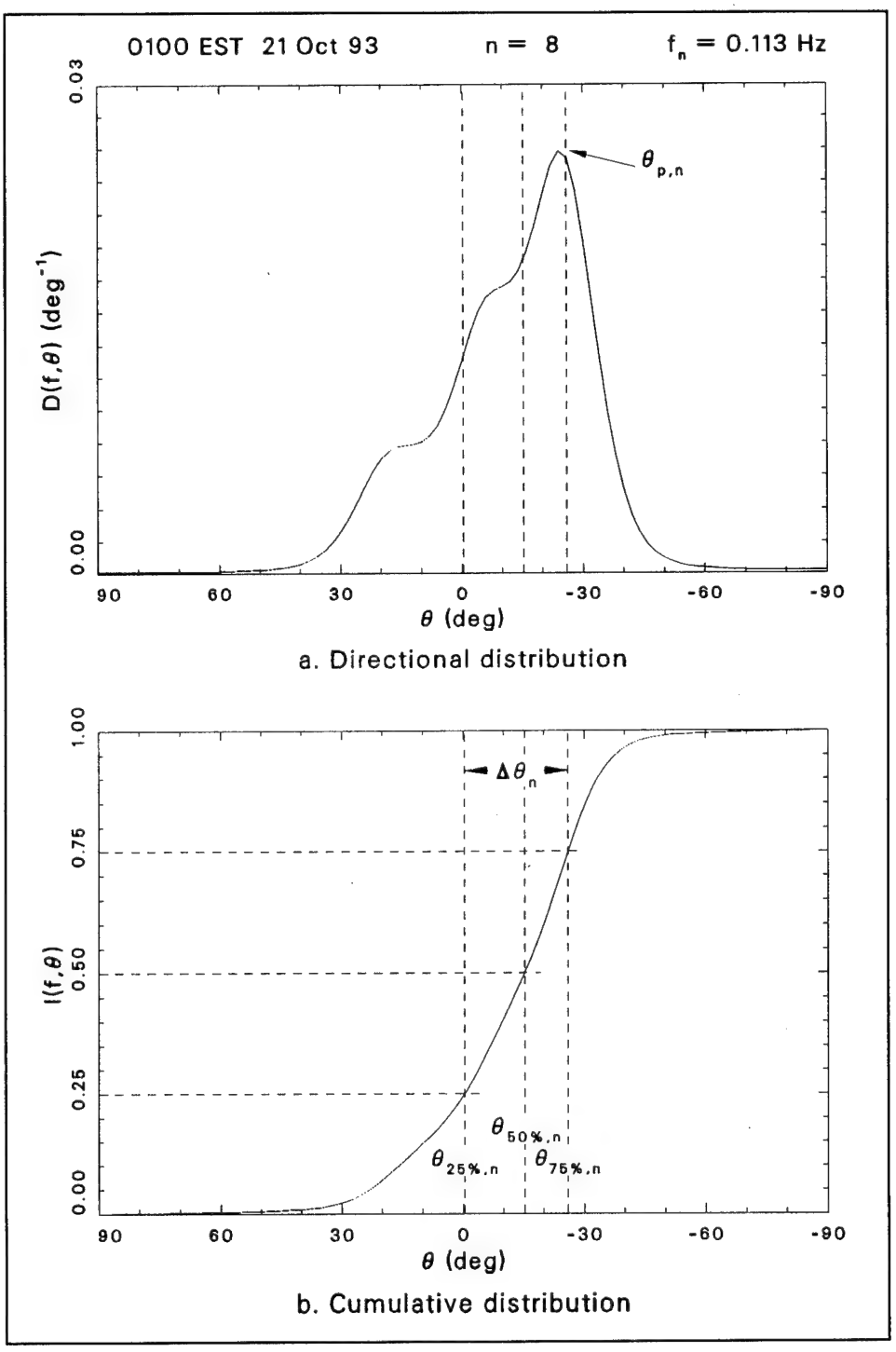

Figure 7. Directional spread computation

$$\Delta\theta_{SW} = \frac{1}{\left(\frac{1}{4}H_{mo}\right)^2} \sum_{n=1}^{N} S(f_n)\,\Delta\theta_n \tag{13}$$

Equation 13 is like Equation 7 for the spectrally weighted peak direction.

Reflection coefficient

Following the definition in the *Shore Protection Manual* (1984), a reflection coefficient is a ratio of incident wave height to reflected wave height. This simple definition is based on the concept of unidirectional, monochromatic waves, which almost never occur in the real ocean. An adaptation of this definition for the purposes of this report is to use characteristic incident wave height $H_{mo,i}$ and characteristic reflected wave height $H_{mo,r}$ to define an energy-based reflection coefficient χ as

$$\chi = \frac{H_{mo,r}}{H_{mo,i}} \tag{14}$$

Incident and reflected wave heights are defined in terms of incident and reflected energy. Squaring both sides of Equation 14 then yields an estimate of the ratio of total reflected to total incident wind wave energy, a characteristic that may be useful in consideration of nearshore dynamics.

Some care must be exercised both in defining and interpreting the characteristic wave heights and their ratio. Intrinsic in all spectral estimates is some level of background system and analysis noise that is not related to wave signals, is often unevenly distributed in direction, and is capable of severely degrading a ratio of entities like that in Equation 14. In a rough attempt to minimize the effects of background noise, a noise estimate is made by finding the minimum of the frequency-direction spectrum at each frequency $S_{\min}(f_n)$, and computing incident energy E_i and reflected energy E_r relative to these minima. Using the full-array frequency-direction spectrum for these computations, the incident energy is

$$E_i = \rho g \sum_{n=1}^{N} \sum_{m=46}^{136} w_m \left[S(f_n, \theta_m) - S_{\min}(f_n) \right] d\theta \, df \tag{15}$$

and the reflected energy is

$$E_r = \rho g \sum_{n=1}^{N} \sum_{m=1}^{46} w_m \left[S(f_n, \theta_m) - S_{\min}(f_n) \right] d\theta \, df + \rho g \sum_{n=1}^{N} \sum_{m=136}^{M} w_m \left[S(f_n, \theta_m) - S_{\min}(f_n) \right] d\theta \, df \tag{16}$$

where ρ is water density, g is gravitational acceleration, and all $w_m = 1$, except $w_1 = w_{46} = w_{136} = w_M = \frac{1}{2}$. The w_m are simply convenient notations that show the proper contributions of the spectrum to the end points of the sums in Equations 15 and 16, and do not otherwise affect the integrations. In terms of incident and reflected energies, the corresponding characteristic wave

heights are $H_{mo,i} = 4\sqrt{E_i/\rho g}$ and $H_{mo,r} = 4\sqrt{E_r/\rho g}$, so that, on substitution into Equation 14, the reflection coefficient becomes

$$\chi = \sqrt{\frac{E_r}{E_i}} \tag{17}$$

The simple noise estimate used here does not eliminate the effects of noise in computing Equation 17 using Equations 15 and 16. This condition is evident in the tabular listings in Appendix A and the plotted results in Appendix B. There is a persistent background level of $\chi \approx 0.1$, which suggests that there is always about 1 percent of incident wave energy propagating back out to sea, a condition that is unlikely to be true. Synthetic data tests by Long and Oltman-Shay (1993) using the algorithms described in this report with a similar array of gauges indicate errors as large as 200 percent for $\chi \approx 0.1$, but with the error dropping rapidly for larger χ. A reasonable way to interpret the results in this report is to consider $\chi \geq 0.2$ as indicative of some reflection, and then to examine such spectra in detail for verification. In the spectrum shown in Figure 6, for example, the tabulated reflection coefficient is 0.26, and the figure does indeed indicate some reflected energy.

Parameter summary

Together, the 12 parameters H_{mo}, $f_{p,FD}$, $f_{p,IFS}$, $T_{p,FD}$, $T_{p,IFS}$, $\theta_{p,FD}$, $\theta_{p,IDS}$, $\theta_{p,SW}$, $\Delta\theta_{IDS}$, $\Delta\theta_{SW}$, $\Delta\theta_{FDP}$, and χ give a bulk characterization of some properties of the frequency-direction spectra discussed in this report. There are, of course, many other parameters that can be defined, but the present set is simple and is easier to use than the 2,639 discrete spectral densities (29 frequencies $\times$ 91 directions) required for a full description of any linear array spectrum, or the 5,249 elements (29 frequencies $\times$ 181 directions) of any full-array spectrum discussed here.

6 Archived Results

Optical disks containing the sets of observed linear-array and full-array frequency-direction spectra from this collection period have been created to archive the observations. Appendix A contains a listing of the date, starting time (EST), and the characterizing parameters defined previously for each case archived. It is intended to be used as an index or catalog of the set of available cases. For reasons explained below, dates in Appendix A are given in the form *yymmdd* to represent year, month, and day, all in two-digit integer form.

Graphic representations of data collection times, some bulk parameters, and some auxiliary environmental variables are contained in Appendix B. One graph is shown for each month of the collection year. The upper part of each graph has time series plots of the bulk parameters H_{mo}, $T_{p,IFS}$, $\theta_{p,IDS}$, and $\Delta\theta_{IDS}$ derived from the linear array, and χ derived from the full array. The lower part of each graph has stick figure plots of three environmental variables. First is a kind of crude wave vector in which the stick vector has a length proportional to H_{mo} and a direction given by $\theta_{p,IDS}$ + 180 deg. The 180 deg is added to provide a physical frame of reference consistent with a vector pointing in the direction of energy propagation. Because peak wave energy is always directed onshore, all stick vectors in this part of the graph will have a component directed upward on the page.

The second stick figure plot is a wind vector as measured with the FRF pier-end anemometer. Mounted at the seaward end of the FRF pier (Figure 2) at an elevation 19.5 m above mean sea level, this instrument gives a reasonable estimate of the wind climate in the vicinity of the 8-m array. A second anemometer at the same elevation, but at the landward end of the pier, serves as a backup instrument. Both anemometers are of the impeller-vane type. Anemometer data are vector averaged and wind velocity variances are computed both in and perpendicular to the mean wind direction. Archived with wave spectral results are mean wind speed, maximum wind speed, wind speed standard deviation, mean wind direction, and a measure of wind direction standard deviation (defined as the arc tangent of the ratio of cross-stream standard deviation of wind velocity to the mean wind speed).

The third stick figure plot is the current vector as measured with a current meter located on the line of the linear array, about 7 m (23 ft) southward of

gauge 8 (Figure 2). Note that this current meter is in a different location from the one used in the first three directional spectral index reports (Long 1991a, 1991b; Long and Smith 1993), or the one used in the subsequent four reports (Long and Smith 1994, Long and Atmadja 1994, Long and Pemberton 1994, Long and Roughton 1994). This instrument was approximately 2.4 m (7.9 ft) off the bottom in water about 8 m (26 ft) deep and, therefore, sensed currents near the bottom. All available current data are plotted. The current meter was subject to storm damage, biological fouling, and duration-related electronic problems, so that data are not available for all of the time covered by this report. Of existing data, the reader may note a significant anticorrelation between cross-shore winds and cross-shore currents. This is consistent with the behavior of wall-bounded, shallow-water, wind-generated currents. Additional details about the anemometers and current meter are given by Birkemeier et al. (1985).

7 Retrieving Processed Data

The electro-optical medium containing the directional-spectral data archive is compact, but not very transportable. Consequently, a conversion program has been written to transform the data into a rather conventional, 80-column, formatted form that is much more easily distributed on common magnetic media or over an electronic network. A user requesting some or all of the data will, by default, receive the data in formatted form. It may be possible to transfer the data in other ways, and specific requests can be coordinated with the FRF.

The data archive for the period covered by this report contains two sets of 1,975 files, one set for linear array results, and the other for full array results, with a file for each collection. When converted to formatted form, a linear array file has a length of about 30,000 bytes and a full array file is about twice this size, so the complete archive for the seventh collection year contains roughly 178 MB of information. A user may wish to consider whether this quantity of information will take too much system space before trying to copy the whole archive. Subsets of data can be created by reading the data archive one file at a time.

An ASCII-formatted file is usually named LA*yymmddhhmm*.ASC for a linear-array frequency-direction spectrum, or FD*yymmddhhmm*.ASC for a full-array frequency-direction spectrum. The character grouping *yymmdd* represents the data collection date (as listed in Appendix A), and the character grouping *hhmm* represents the data collection start time as hour and minute, both in two-digit integer form (also from Appendix A).

Once a file is on equipment and in a position to be read, it can be input to a computer program through any ASCII-formatted read statement. Appendix C contains a listing of a FORTRAN program that can read the formatted data files. The variables contained in a data file are listed in the header of the program in Appendix C. A listing of a sample data file of linear-array results is given in Appendix D. The read statements in the program in Appendix C can be visually aligned with the data fields of the listing in Appendix D if the user wishes to edit or visually read a data file. Program variable names, especially those that have parallel symbols in this text, are also listed in the Notation (Appendix E).

A user can obtain data by communicating with the FRF via:

Surface mail	Chief, Field Research Facility 1261 Duck Road Kitty Hawk, NC 27949-4472
Telephone	(919) 261-3511
FAX	(919) 261-4432

or any of the following internet addresses:

long@duck.wes.army.mil
baron@duck.wes.army.mil
bill@duck.wes.army.mil

8 Summary of Results

Data from 9 months of the eighth collection year of high-resolution, directional-spectral observations at the FRF have been put in a form that is easily accessible to researchers interested in nearshore processes. Directional gauge array, directional analysis algorithms, and definitions of characterizing parameters are described in the body of this report, as are the location and form of archived data. Both a listing and a graphic presentation of data collection times and characteristic parameters are given in the appendixes. The appendixes also contain a sample data file and a listing of a FORTRAN program that can be used to read a data file.

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Appendix A
Table of Collection Times and Bulk Parameters

Table A1
Collection Times and Bulk Parameters

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
930924	0100	0.40	0.083	0.083	11.98	11.98	-8.0	-14.0	-22.0	37.6	23.6	21.8	0.28
930924	0400	0.35	0.083	0.083	11.98	11.98	-4.0	-12.0	-22.7	33.9	26.8	25.4	0.29
930924	0700	0.34	0.083	0.083	11.98	11.98	-8.0	-16.0	-9.6	45.6	33.4	25.0	0.29
930924	1000	1.11	0.230	0.220	4.35	4.54	48.0	46.0	45.3	24.2	21.8	15.0	0.17
930924	1300	1.40	0.171	0.171	5.83	5.83	34.0	36.0	40.2	23.6	20.2	14.3	0.20
930924	1600	1.25	0.171	0.162	5.83	6.19	30.0	30.0	39.0	23.0	21.9	15.7	0.17
930924	1900	1.05	0.152	0.152	6.59	6.59	26.0	26.0	32.6	22.3	22.1	9.7	0.12
930924	2200	0.92	0.142	0.142	7.04	7.04	20.0	22.0	24.2	28.1	27.6	13.0	0.11
930925	0100	0.84	0.142	0.142	7.04	7.04	20.0	14.0	24.4	28.5	28.7	15.6	0.12
930925	0400	0.71	0.162	0.162	6.19	6.19	30.0	30.0	23.4	28.8	26.9	15.5	0.13
930925	0700	0.65	0.171	0.171	5.83	5.83	30.0	30.0	23.3	36.1	27.8	13.6	0.11
930925	1000	0.64	0.191	0.152	5.24	6.59	28.0	20.0	17.6	40.7	34.2	24.6	0.10
930925	1300	0.67	0.162	0.162	6.19	6.19	14.0	12.0	6.2	39.7	38.2	15.5	0.13
930925	1600	0.65	0.171	0.269	5.83	3.72	20.0	6.0	-3.3	42.5	37.7	42.0	0.14
930925	1900	0.55	0.240	0.269	4.17	3.72	14.0	14.0	0.5	40.2	33.7	43.1	0.15
930925	2200	0.56	0.308	0.259	3.25	3.86	-58.0	14.0	-11.6	50.1	39.5	47.3	0.15
930926	0100	0.61	0.220	0.210	4.54	4.75	-48.0	-44.0	-36.2	42.2	35.3	34.3	0.15
930926	0400	0.59	0.210	0.201	4.75	4.98	-44.0	-42.0	-37.0	33.3	29.0	24.4	0.15
930926	0700	0.55	0.210	0.191	4.75	5.24	-44.0	-26.0	-33.2	28.1	24.7	20.2	0.16
930926	1000	0.54	0.191	0.191	5.24	5.24	-42.0	-28.0	-36.1	28.3	24.2	23.1	0.18
930926	1300	0.52	0.210	0.191	4.75	5.24	-48.0	-48.0	-38.4	30.3	23.1	26.2	0.21
930926	1600	0.53	0.201	0.093	4.98	10.72	-50.0	-50.0	-42.5	26.5	18.8	17.1	0.26
930926	1900	0.48	0.093	0.093	10.72	10.72	-32.0	-50.0	-39.1	27.0	16.0	20.6	0.26
930926	2200	0.44	0.103	0.103	9.71	9.71	-36.0	-36.0	-35.6	24.3	19.1	21.2	0.20
930927	0100	0.47	0.103	0.103	9.71	9.71	-34.0	-34.0	-37.0	26.4	18.9	19.9	0.31
930927	0400	0.50	0.103	0.103	9.71	9.71	-34.0	-38.0	-39.1	26.5	21.5	22.4	0.27
930927	0700	0.57	0.113	0.113	8.87	8.87	-24.0	-40.0	-33.9	25.3	19.8	19.8	0.29
930927	1000	0.59	0.113	0.113	8.87	8.87	-24.0	-40.0	-35.7	21.8	16.0	15.3	0.19
930927	1300	0.63	0.113	0.113	8.87	8.87	-24.0	-52.0	-36.4	25.0	13.8	14.8	0.26
930927	1600	0.73	0.152	0.103	6.59	9.71	-42.0	-52.0	-40.1	23.1	11.5	14.0	0.26
930927	1900	0.58	0.152	0.113	6.59	8.87	-44.0	-44.0	-42.4	22.7	11.8	17.1	0.25
930927	2200	0.47	0.142	0.113	7.04	8.87	-40.0	-38.0	-34.9	23.4	16.1	18.0	0.21
930928	0100	0.64	0.113	0.113	8.87	8.87	-26.0	66.0	24.5	87.1	19.4	22.4	0.20
930928	0400	0.78	0.201	0.220	4.98	4.54	48.0	48.0	31.5	57.2	17.3	11.7	0.21
930928	0700	0.66	0.210	0.210	4.75	4.75	52.0	56.0	21.7	76.0	19.9	10.4	0.20
930928	1000	0.56	0.210	0.113	4.75	8.87	52.0	-38.0	7.8	81.5	23.3	19.9	0.16

(Sheet 1 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
930928	1300	0.53	0.162	0.113	6.19	8.87	-40.0	-38.0	0.6	60.3	43.5	25.3	0.15
930928	1600	0.49	0.123	0.123	8.16	8.16	-24.0	-36.0	-6.9	55.5	45.8	15.9	0.21
930928	1900	0.44	0.132	0.123	7.56	8.16	-36.0	-36.0	-19.9	43.4	42.0	19.2	0.24
930928	2200	0.42	0.113	0.113	8.87	8.87	-22.0	-36.0	-20.3	36.9	32.2	21.3	0.19
930929	0100	0.40	0.171	0.123	5.83	8.16	-44.0	-34.0	-26.0	35.1	31.2	24.1	0.20
930929	0400	0.44	0.308	0.113	3.25	8.87	90.0	-28.0	-2.2	58.9	27.9	20.4	0.23
930929	0700	0.51	0.259	0.279	3.86	3.59	64.0	66.0	32.2	87.2	24.0	18.0	0.21
930929	1000	0.54	0.259	0.259	3.86	3.86	66.0	66.0	29.1	76.7	25.2	23.5	0.20
930929	1300	0.54	0.123	0.259	8.16	3.86	-32.0	-30.0	23.1	66.9	31.8	38.0	0.20
930929	1600	0.45	0.123	0.123	8.16	8.16	-32.0	-30.0	1.6	59.7	31.8	23.7	0.24
930929	1900	0.40	0.113	0.123	8.87	8.16	-30.0	-32.0	1.8	52.9	33.5	27.6	0.24
930929	2200	0.37	0.132	0.113	7.56	8.87	-30.0	-18.0	-2.1	44.7	30.4	27.6	0.20
930930	0100	0.39	0.123	0.123	8.16	8.16	-34.0	-16.0	-6.2	40.3	30.1	27.8	0.20
930930	0400	0.38	0.123	0.123	8.16	8.16	-36.0	-18.0	-17.6	36.6	32.3	27.2	0.25
930930	0700	0.39	0.318	0.318	3.15	3.15	64.0	64.0	8.6	80.5	28.0	10.4	0.30
930930	1000	1.41	0.171	0.171	5.83	5.83	46.0	50.0	49.6	14.7	12.8	7.9	0.18
930930	1300	1.51	0.171	0.162	5.83	6.19	42.0	42.0	40.8	19.3	16.8	15.2	0.17
930930	1600	1.34	0.171	0.171	5.83	5.83	32.0	54.0	41.4	21.7	16.6	13.1	0.18
930930	1900	1.12	0.181	0.181	5.52	5.52	34.0	34.0	39.0	21.1	18.1	15.0	0.17
930930	2200	0.96	0.171	0.181	5.83	5.52	28.0	46.0	38.3	21.4	17.2	17.3	0.12
931001	0100	1.02	0.171	0.171	5.83	5.83	26.0	46.0	36.4	24.4	20.9	16.9	0.11
931001	0400	0.96	0.162	0.181	6.19	5.52	20.0	46.0	34.6	29.5	19.7	18.7	0.14
931001	1000	0.79	0.181	0.181	5.52	5.52	40.0	40.0	24.4	37.5	20.4	14.8	0.13
931001	1300	0.81	0.152	0.152	6.59	6.59	14.0	40.0	10.8	51.0	23.5	21.9	0.11
931001	1600	0.96	0.162	0.152	6.19	6.59	14.0	14.0	7.3	39.5	25.8	20.6	0.12
931001	1900	0.96	0.093	0.103	10.72	9.71	-16.0	-16.0	1.9	35.4	25.5	27.0	0.14
931001	2200	0.94	0.103	0.103	9.71	9.71	0.0	0.0	4.3	32.8	25.0	22.1	0.12
931002	0100	1.00	0.103	0.103	9.71	9.71	-14.0	-14.0	-4.3	26.3	22.8	16.3	0.09
931002	0400	0.96	0.103	0.103	9.71	9.71	-12.0	-14.0	-4.6	24.9	24.6	19.6	0.12
931002	0700	0.90	0.103	0.103	9.71	9.71	-18.0	-16.0	-8.0	23.5	23.9	20.1	0.16
931002	1000	0.86	0.103	0.103	9.71	9.71	-18.0	-6.0	-10.5	22.6	22.9	19.4	0.14
931002	1300	0.88	0.103	0.103	9.71	9.71	-4.0	-4.0	-6.9	24.1	23.4	18.6	0.10
931002	1600	0.84	0.103	0.103	9.71	9.71	-4.0	-2.0	-8.6	24.9	24.1	19.7	0.13
931002	1900	0.76	0.103	0.103	9.71	9.71	-14.0	-12.0	-13.5	27.0	23.5	21.9	0.16
931002	2200	0.70	0.103	0.103	9.71	9.71	-18.0	-18.0	-18.4	27.2	23.3	18.9	0.16
931003	0100	0.62	0.113	0.113	8.87	8.87	-18.0	-20.0	-19.0	27.4	21.7	18.9	0.14
931003	0400	0.59	0.113	0.113	8.87	8.87	-26.0	-24.0	-23.4	27.1	21.4	18.9	0.17
931003	0700	0.53	0.113	0.113	8.87	8.87	-30.0	-22.0	-24.0	29.2	23.5	26.1	0.20
931003	1000	0.47	0.113	0.113	8.87	8.87	-20.0	-24.0	-12.6	35.1	27.0	26.8	0.23
931003	1300	0.91	0.240	0.240	4.17	4.17	56.0	58.0	43.0	24.0	16.7	10.4	0.18
931003	1600	0.79	0.240	0.240	4.17	4.17	58.0	58.0	36.1	56.5	24.9	15.1	0.14
931003	1900	0.74	0.113	0.113	8.87	8.87	-22.0	56.0	23.9	65.9	26.6	20.3	0.13
931003	2200	0.66	0.113	0.113	8.87	8.87	-32.0	-32.0	17.1	63.9	30.5	24.6	0.15
931004	0100	0.61	0.103	0.113	9.71	8.87	-14.0	-14.0	9.4	55.7	29.5	21.9	0.16
931004	0400	0.57	0.113	0.113	8.87	8.87	-22.0	-20.0	1.9	41.3	32.4	22.6	0.14
931004	0700	0.54	0.113	0.113	8.87	8.87	-22.0	-24.0	-10.8	36.5	31.1	21.7	0.17
931004	1000	0.52	0.113	0.113	8.87	8.87	-14.0	-14.0	-10.5	34.8	30.4	19.8	0.18
931004	1300	0.49	0.113	0.113	8.87	8.87	-16.0	-18.0	-14.7	26.1	28.4	21.4	0.16
931004	1600	0.50	0.113	0.113	8.87	8.87	-30.0	-30.0	-28.0	24.6	25.9	21.3	0.16
931004	1900	0.49	0.113	0.113	8.87	8.87	-16.0	-30.0	-25.1	25.4	22.8	22.0	0.22
931004	2200	0.46	0.113	0.113	8.87	8.87	-16.0	-24.0	-27.4	25.3	21.3	20.1	0.24
931005	0100	0.43	0.113	0.113	8.87	8.87	-18.0	-32.0	-27.4	23.7	20.7	20.4	0.20
931005	0400	0.41	0.113	0.113	8.87	8.87	-30.0	-30.0	-30.6	21.9	19.5	19.2	0.20
931005	0700	0.42	0.113	0.113	8.87	8.87	-30.0	-30.0	-29.2	24.1	22.3	20.4	0.25
931005	1000	0.53	0.113	0.113	8.87	8.87	-32.0	62.0	11.1	80.1	23.1	23.4	0.21
931005	1300	1.17	0.201	0.201	4.98	4.98	46.0	50.0	38.4	27.5	22.6	18.2	0.13
931005	1600	1.44	0.171	0.171	5.83	5.83	40.0	40.0	34.7	27.9	24.7	18.9	0.12
931005	1900	1.31	0.171	0.162	5.83	6.19	34.0	24.0	29.1	32.1	26.3	21.2	0.13

(Sheet 2 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931005	2200	1.17	0.162	0.162	6.19	6.19	20.0	22.0	29.3	34.8	27.6	17.2	0.11
931006	0100	1.13	0.142	0.210	7.04	4.75	26.0	24.0	27.6	38.3	29.9	30.1	0.10
931006	0400	1.13	0.152	0.201	6.59	4.98	26.0	28.0	23.8	38.8	30.1	24.6	0.09
931006	0700	1.18	0.210	0.191	4.75	5.24	18.0	22.0	17.8	38.9	31.4	23.1	0.10
931006	1000	1.16	0.191	0.191	5.24	5.24	26.0	28.0	19.0	42.3	37.2	29.8	0.11
931006	1300	1.07	0.201	0.181	4.98	5.52	34.0	12.0	13.0	41.8	35.8	30.7	0.10
931006	1600	1.01	0.191	0.191	5.24	5.24	22.0	-16.0	10.0	39.3	34.3	28.1	0.10
931006	1900	1.04	0.181	0.181	5.52	5.52	28.0	-18.0	7.8	39.4	34.6	31.1	0.10
931006	2200	1.08	0.132	0.171	7.56	5.83	-26.0	-8.0	1.9	40.1	36.7	34.5	0.11
931007	0100	1.15	0.171	0.171	5.83	5.83	-8.0	-10.0	3.1	39.4	36.8	28.8	0.10
931007	0400	1.15	0.171	0.171	5.83	5.83	-2.0	0.0	-2.1	32.2	30.5	21.8	0.10
931007	0700	1.07	0.162	0.162	6.19	6.19	-40.0	-12.0	-15.7	36.8	39.3	38.5	0.11
931007	1000	0.98	0.074	0.171	13.56	5.83	-20.0	-16.0	-29.6	37.1	39.8	36.8	0.12
931007	1300	0.89	0.171	0.132	5.83	7.56	-40.0	-38.0	-33.1	37.2	37.7	25.6	0.12
931007	1600	0.90	0.162	0.074	6.19	13.56	-40.0	-36.0	-34.1	36.0	35.6	25.2	0.12
931007	1900	1.01	0.171	0.074	5.83	13.56	-42.0	-38.0	-34.5	33.4	31.9	23.7	0.12
931007	2200	1.03	0.152	0.152	6.59	6.59	-38.0	-36.0	-33.3	30.2	26.7	14.1	0.13
931008	0100	1.02	0.142	0.152	7.04	6.59	-38.0	-38.0	-35.1	29.6	26.0	18.2	0.13
931008	0400	0.95	0.142	0.152	7.04	6.59	-34.0	-32.0	-33.8	29.3	24.8	18.8	0.13
931008	0700	1.25	0.152	0.142	6.59	7.04	-36.0	-34.0	-33.4	27.2	25.0	14.7	0.12
931008	1000	1.85	0.142	0.162	7.04	6.19	-36.0	-36.0	-29.0	29.7	26.6	15.7	0.10
931008	1300	2.03	0.123	0.123	8.16	8.16	-30.0	-28.0	-12.4	37.4	26.8	11.0	0.10
931008	1600	1.85	0.123	0.113	8.16	8.87	-30.0	-28.0	-2.6	47.8	27.1	13.1	0.11
931008	1900	1.75	0.123	0.123	8.16	8.16	-38.0	24.0	8.4	54.4	22.6	19.1	0.12
931008	2200	1.56	0.123	0.123	8.16	8.16	-28.0	12.0	14.3	43.7	29.8	33.3	0.10
931009	0100	1.32	0.132	0.132	7.56	7.56	10.0	12.0	7.6	37.0	31.8	39.0	0.10
931009	0400	1.02	0.152	0.132	6.59	7.56	12.0	10.0	5.4	35.5	29.7	39.8	0.10
931009	0700	0.82	0.132	0.123	7.56	8.16	-38.0	-38.0	-12.9	42.4	31.6	27.2	0.11
931009	1000	0.66	0.132	0.132	7.56	7.56	-28.0	-28.0	-17.2	41.2	33.2	22.4	0.14
931009	1300	0.57	0.123	0.123	8.16	8.16	-30.0	-30.0	-22.0	40.1	35.8	13.7	0.17
931009	1600	0.54	0.132	0.132	7.56	7.56	-40.0	-38.0	-35.6	34.1	27.5	13.5	0.19
931009	1900	0.57	0.132	0.132	7.56	7.56	-34.0	-36.0	-35.3	26.0	17.6	10.4	0.18
931009	2200	0.56	0.142	0.123	7.04	8.16	-36.0	-30.0	-33.7	30.5	17.6	17.4	0.19
931010	0100	0.51	0.123	0.132	8.16	7.56	-34.0	-34.0	-32.0	31.9	20.2	20.7	0.19
931010	0400	0.50	0.113	0.123	8.87	8.16	-20.0	-20.0	-28.6	28.0	20.0	16.8	0.21
931010	0700	0.51	0.123	0.132	8.16	7.56	-20.0	-28.0	-27.9	22.4	18.5	13.9	0.21
931010	1000	1.10	0.210	0.220	4.75	4.54	48.0	56.0	38.4	30.4	17.1	14.2	0.20
931010	1300	2.38	0.142	0.142	7.04	7.04	42.0	44.0	42.1	22.9	21.3	21.4	0.20
931010	1600	2.37	0.132	0.132	7.56	7.56	22.0	22.0	33.1	23.6	19.7	10.5	0.20
931010	1900	2.23	0.132	0.132	7.56	7.56	22.0	22.0	32.8	26.2	22.3	14.2	0.16
931010	2200	2.22	0.132	0.132	7.56	7.56	20.0	20.0	29.0	27.1	23.8	14.9	0.16
931011	0100	2.32	0.132	0.132	7.56	7.56	10.0	16.0	27.2	27.8	25.0	18.4	0.16
931011	0400	2.28	0.132	0.132	7.56	7.56	12.0	14.0	23.8	27.2	24.7	16.8	0.14
931011	0700	2.05	0.123	0.123	8.16	8.16	10.0	10.0	19.8	28.2	26.8	16.4	0.12
931011	1000	2.04	0.103	0.132	9.71	7.56	-8.0	8.0	17.1	31.1	27.2	24.8	0.11
931011	1300	2.41	0.123	0.123	8.16	8.16	-4.0	4.0	9.9	29.0	27.6	21.1	0.12
931011	1600	2.64	0.103	0.123	9.71	8.16	-6.0	-6.0	12.8	29.0	27.8	20.9	0.11
931011	1900	2.52	0.123	0.123	8.16	8.16	6.0	4.0	6.0	27.6	27.1	19.9	0.11
931011	2200	2.23	0.113	0.123	8.87	8.16	-2.0	-4.0	5.4	27.0	26.9	21.6	0.10
931012	0100	2.13	0.113	0.113	8.87	8.87	-4.0	-2.0	4.0	31.0	32.8	16.5	0.11
931012	0400	2.00	0.123	0.123	8.16	8.16	-2.0	0.0	-4.8	33.3	35.2	28.4	0.13
931012	0700	1.51	0.113	0.113	8.87	8.87	0.0	2.0	3.6	28.0	31.6	18.3	0.13
931012	1000	1.15	0.103	0.103	9.71	9.71	-8.0	-6.0	1.3	26.1	26.4	17.0	0.13
931012	1300	1.04	0.103	0.103	9.71	9.71	-6.0	-2.0	8.9	29.6	25.1	18.3	0.20
931012	1600	0.94	0.093	0.103	10.72	9.71	-2.0	2.0	13.2	29.0	24.8	16.6	0.21
931012	2200	0.69	0.103	0.103	9.71	9.71	2.0	4.0	7.6	26.5	27.1	18.3	0.18
931013	0100	0.67	0.123	0.113	8.16	8.87	20.0	14.0	13.0	29.7	27.4	29.1	0.20

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931013	0400	0.61	0.123	0.113	8.16	8.87	12.0	18.0	16.5	33.7	27.4	29.0	0.19
931013	0700	0.59	0.123	0.123	8.16	8.16	10.0	10.0	13.1	34.1	26.1	24.6	0.21
931013	1000	0.57	0.132	0.123	7.56	8.16	12.0	12.0	9.9	33.4	24.8	26.4	0.19
931013	1300	0.60	0.132	0.132	7.56	7.56	12.0	12.0	16.3	36.8	24.8	22.7	0.19
931013	1600	0.61	0.093	0.103	10.72	9.71	4.0	28.0	21.8	39.7	26.2	22.3	0.14
931013	1900	0.59	0.220	0.103	4.54	9.71	46.0	30.0	16.4	45.5	26.4	22.2	0.18
931013	2200	0.57	0.132	0.103	7.56	9.71	14.0	14.0	14.1	46.4	24.6	18.8	0.15
931014	0100	0.60	0.113	0.113	8.87	8.87	-6.0	14.0	11.1	41.2	28.3	16.3	0.17
931014	0400	0.75	0.083	0.259	11.98	3.86	-12.0	12.0	7.2	38.4	30.7	29.0	0.11
931014	0700	0.92	0.230	0.210	4.35	4.75	20.0	16.0	11.9	34.1	29.0	23.4	0.10
931014	1000	1.15	0.171	0.181	5.83	5.52	-8.0	-8.0	0.9	28.3	25.7	19.5	0.10
931014	1300	1.18	0.171	0.171	5.83	5.83	4.0	-4.0	1.8	26.6	25.0	14.3	0.11
931014	1600	1.18	0.093	0.171	10.72	5.83	-10.0	-10.0	0.9	27.3	25.0	20.5	0.11
931014	1900	1.11	0.171	0.162	5.83	6.19	8.0	-10.0	1.3	28.7	26.6	19.5	0.13
931014	2200	1.05	0.171	0.162	5.83	6.19	12.0	-8.0	2.4	25.7	24.2	19.8	0.11
931015	0100	1.01	0.093	0.171	10.72	5.83	-12.0	-8.0	1.6	25.8	22.8	18.1	0.12
931015	0400	1.00	0.171	0.162	5.83	6.19	8.0	-10.0	5.1	27.5	25.9	21.2	0.13
931015	0700	1.00	0.171	0.152	5.83	6.59	6.0	4.0	3.4	28.0	27.1	19.5	0.13
931015	1000	0.89	0.162	0.162	6.19	6.19	14.0	-6.0	9.4	29.2	27.0	17.1	0.12
931015	1300	0.90	0.123	0.171	8.16	5.83	0.0	0.0	2.7	27.2	25.3	20.4	0.11
931015	1600	0.98	0.132	0.132	7.56	7.56	-8.0	-8.0	-2.8	28.1	26.6	13.1	0.12
931015	1900	1.01	0.132	0.123	7.56	8.16	-8.0	-8.0	0.6	27.6	27.8	13.9	0.13
931015	2200	0.97	0.113	0.113	8.87	8.87	0.0	0.0	4.0	26.8	25.6	9.1	0.12
931016	0100	1.05	0.113	0.113	8.87	8.87	-12.0	0.0	-0.1	24.0	24.7	15.0	0.10
931016	0400	1.11	0.113	0.113	8.87	8.87	2.0	2.0	-1.3	26.0	26.4	16.7	0.10
931016	0700	1.04	0.123	0.113	8.16	8.87	0.0	0.0	0.3	29.1	29.1	18.9	0.11
931016	1000	0.91	0.123	0.113	8.16	8.87	0.0	0.0	-2.5	31.9	33.3	21.9	0.12
931016	1300	0.89	0.123	0.123	8.16	8.16	2.0	0.0	-2.9	28.0	30.1	18.5	0.11
931016	1600	0.92	0.113	0.113	8.87	8.87	2.0	2.0	-2.3	27.2	29.7	15.8	0.12
931016	1900	0.88	0.113	0.113	8.87	8.87	-4.0	-4.0	-4.5	26.7	28.8	16.7	0.15
931016	2200	0.84	0.123	0.123	8.16	8.16	-6.0	-4.0	-4.3	30.2	32.8	23.0	0.15
931017	0100	0.92	0.123	0.123	8.16	8.16	-12.0	-12.0	-12.9	29.8	33.6	17.9	0.12
931017	0400	1.15	0.113	0.132	8.87	7.56	4.0	-16.0	-24.4	38.5	30.4	19.3	0.13
931017	0700	1.58	0.191	0.191	5.24	5.24	-24.0	-22.0	-19.9	34.9	33.5	24.6	0.11
931017	1000	2.08	0.162	0.162	6.19	6.19	-30.0	-32.0	-16.1	35.6	36.0	27.5	0.10
931017	1300	1.77	0.132	0.132	7.56	7.56	-38.0	-38.0	-15.3	37.1	33.9	23.5	0.10
931017	1600	1.59	0.132	0.132	7.56	7.56	-32.0	-16.0	-17.3	33.6	32.0	27.9	0.11
931017	1900	1.36	0.123	0.123	8.16	8.16	-10.0	-10.0	-10.4	39.8	33.8	30.3	0.14
931017	2200	1.04	0.113	0.113	8.87	8.87	-38.0	50.0	-4.3	60.6	33.7	31.6	0.17
931018	0100	0.91	0.113	0.113	8.87	8.87	-14.0	4.0	6.9	48.5	29.2	27.7	0.12
931018	0400	0.85	0.123	0.123	8.16	8.16	-38.0	-2.0	-4.0	41.1	30.2	37.4	0.14
931018	0700	0.81	0.113	0.123	8.87	8.16	-2.0	0.0	7.7	35.2	30.7	34.5	0.20
931018	1000	0.86	0.103	0.103	9.71	9.71	-12.0	0.0	7.4	39.3	26.9	22.8	0.19
931018	1300	0.89	0.113	0.113	8.87	8.87	-16.0	2.0	5.2	45.1	25.9	21.9	0.14
931018	1600	0.89	0.113	0.103	8.87	9.71	-14.0	-12.0	-3.5	42.7	27.2	18.7	0.11
931018	1900	0.83	0.113	0.113	8.87	8.87	-10.0	-10.0	-2.1	43.2	31.0	27.1	0.16
931018	2200	0.77	0.103	0.103	9.71	9.71	-2.0	-6.0	2.4	42.3	29.4	20.8	0.18
931019	0100	0.69	0.103	0.103	9.71	9.71	-12.0	-12.0	-3.9	37.6	28.1	18.5	0.14
931019	0400	0.68	0.103	0.113	9.71	8.87	-2.0	-10.0	-1.0	32.8	27.3	21.0	0.13
931019	0700	0.67	0.113	0.113	8.87	8.87	-12.0	-10.0	-7.7	35.2	32.6	20.6	0.17
931019	1000	0.63	0.113	0.113	8.87	8.87	-16.0	-16.0	-2.7	38.2	33.7	19.8	0.18
931019	1300	0.59	0.113	0.113	8.87	8.87	-8.0	-12.0	-5.8	36.2	34.2	22.8	0.19
931019	1600	0.60	0.123	0.113	8.16	8.87	-16.0	-14.0	-11.9	32.2	31.7	22.8	0.14
931019	1900	0.63	0.113	0.113	8.87	8.87	-14.0	-16.0	-12.5	31.8	34.4	19.9	0.19
931019	2200	0.63	0.113	0.113	8.87	8.87	-2.0	-2.0	-16.1	35.1	36.9	25.3	0.21
931020	0100	0.66	0.103	0.103	9.71	9.71	-2.0	-12.0	-3.9	33.4	31.9	16.9	0.18
931020	0400	0.66	0.113	0.113	8.87	8.87	-16.0	8.0	-2.6	32.4	28.5	22.2	0.14
931020	0700	0.64	0.113	0.113	8.87	8.87	-8.0	-10.0	-3.0	28.0	26.8	18.2	0.17

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931020	1000	0.64	0.113	0.113	8.87	8.87	-20.0	-18.0	-19.0	29.5	28.8	21.1	0.19
931020	1300	0.61	0.113	0.113	8.87	8.87	-18.0	-16.0	-24.3	28.3	27.0	20.2	0.21
931020	1600	0.61	0.113	0.113	8.87	8.87	-8.0	-10.0	-21.0	28.5	24.2	19.3	0.18
931020	1900	0.57	0.113	0.113	8.87	8.87	-16.0	-16.0	-22.6	27.9	24.4	22.8	0.20
931020	2200	0.54	0.103	0.113	9.71	8.87	-14.0	-12.0	-19.2	29.5	27.2	27.7	0.22
931021	0100	0.50	0.113	0.113	8.87	8.87	-24.0	-18.0	-20.8	30.2	28.6	25.6	0.26
931021	0400	0.49	0.113	0.113	8.87	8.87	-14.0	-14.0	-23.5	30.0	28.4	20.4	0.24
931021	0700	0.55	0.123	0.123	8.16	8.16	-20.0	-8.0	-30.3	35.8	25.7	25.2	0.23
931021	1000	0.63	0.113	0.113	8.87	8.87	18.0	-2.0	-27.4	47.3	30.3	33.8	0.19
931021	1300	0.71	0.123	0.123	8.16	8.16	14.0	14.0	-13.6	54.5	25.2	22.6	0.20
931021	1600	0.68	0.123	0.123	8.16	8.16	18.0	18.0	-10.4	52.1	22.8	21.1	0.19
931021	1900	0.65	0.123	0.123	8.16	8.16	16.0	-46.0	-18.5	50.1	21.4	21.3	0.19
931021	2200	0.63	0.181	0.181	5.52	5.52	-46.0	-46.0	-22.3	48.3	22.2	12.1	0.20
931022	0100	1.21	0.230	0.230	4.35	4.35	50.0	50.0	36.7	34.4	24.3	12.4	0.15
931022	0400	1.40	0.191	0.191	5.24	5.24	42.0	44.0	41.9	23.8	20.0	11.6	0.14
931022	0700	1.50	0.171	0.171	5.83	5.83	32.0	38.0	36.9	27.1	22.3	13.6	0.12
931022	1000	1.46	0.152	0.162	6.59	6.19	18.0	42.0	37.1	30.7	26.8	21.7	0.12
931022	1300	1.13	0.152	0.152	6.59	6.59	22.0	36.0	33.2	32.6	28.2	17.8	0.13
931022	1600	0.86	0.162	0.162	6.19	6.19	36.0	38.0	26.3	42.6	29.5	22.4	0.14
931022	1900	0.77	0.074	0.074	13.56	13.56	-8.0	28.0	17.8	44.1	32.7	16.4	0.16
931022	2200	0.79	0.074	0.074	13.56	13.56	-8.0	-10.0	20.3	47.5	33.3	16.8	0.16
931023	0100	0.90	0.074	0.074	13.56	13.56	-8.0	-10.0	23.7	52.1	28.9	18.5	0.18
931023	0400	1.05	0.074	0.210	13.56	4.75	-10.0	20.0	24.0	46.5	24.8	22.5	0.15
931023	0700	1.27	0.210	0.201	4.75	4.98	48.0	16.0	32.8	40.1	26.1	24.2	0.13
931023	1000	1.47	0.171	0.171	5.83	5.83	18.0	18.0	28.6	34.6	27.1	18.9	0.13
931023	1300	1.39	0.171	0.171	5.83	5.83	42.0	42.0	35.1	33.0	25.8	20.0	0.14
931023	1600	1.24	0.162	0.162	6.19	6.19	20.0	40.0	27.8	35.1	25.5	22.8	0.15
931023	1900	1.17	0.083	0.152	11.98	6.59	-8.0	20.0	23.7	38.6	24.3	17.4	0.13
931023	2200	1.15	0.083	0.152	11.98	6.59	-12.0	14.0	14.1	36.0	26.0	21.4	0.14
931024	0100	1.01	0.083	0.083	11.98	11.98	-12.0	-12.0	12.5	39.8	27.4	18.2	0.17
931024	0400	0.92	0.074	0.083	13.56	11.98	-10.0	-10.0	7.3	36.9	29.6	23.0	0.19
931024	0700	0.93	0.074	0.083	13.56	11.98	-12.0	-12.0	4.0	33.5	29.7	19.8	0.18
931024	1000	0.96	0.083	0.083	11.98	11.98	-10.0	-10.0	-2.5	31.2	32.2	16.8	0.18
931024	1300	0.99	0.064	0.083	15.63	11.98	-10.0	-12.0	-11.0	27.9	30.1	19.4	0.17
931024	1600	0.91	0.064	0.083	15.63	11.98	-14.0	-14.0	-12.0	27.6	29.0	22.7	0.19
931024	1900	0.93	0.074	0.074	13.56	13.56	-12.0	-12.0	-13.5	23.6	26.9	12.9	0.20
931024	2200	0.90	0.074	0.074	13.56	13.56	-12.0	-14.0	-17.0	27.2	30.0	15.8	0.21
931025	0100	0.87	0.074	0.074	13.56	13.56	-8.0	-10.0	-18.0	28.8	29.7	14.2	0.21
931025	0400	0.83	0.074	0.074	13.56	13.56	-12.0	-14.0	-24.6	32.2	29.5	16.3	0.18
931025	0700	0.88	0.074	0.074	13.56	13.56	-14.0	-14.0	-20.3	31.4	25.7	14.0	0.17
931025	1000	0.93	0.074	0.074	13.56	13.56	-12.0	-12.0	-16.7	32.5	24.8	13.9	0.16
931025	1300	0.95	0.083	0.083	11.98	11.98	-8.0	-10.0	-12.4	36.1	27.0	11.4	0.14
931025	1600	0.96	0.074	0.083	13.56	11.98	-10.0	-38.0	-10.5	40.3	25.0	14.8	0.13
931025	1900	0.97	0.074	0.083	13.56	11.98	-12.0	-14.0	-11.6	39.0	27.8	18.5	0.13
931025	2200	0.96	0.123	0.083	8.16	11.98	-38.0	-38.0	-20.2	34.5	24.9	18.2	0.12
931026	0100	1.13	0.152	0.162	6.59	6.19	-40.0	-40.0	-18.0	34.1	24.5	14.7	0.11
931026	0400	1.32	0.132	0.132	7.56	7.56	-38.0	-38.0	-14.8	38.9	27.6	14.6	0.11
931026	0700	1.44	0.123	0.123	8.16	8.16	-36.0	-36.0	-14.9	37.2	26.8	14.6	0.09
931026	1000	1.56	0.123	0.123	8.16	8.16	-32.0	-34.0	-18.1	33.6	25.0	9.5	0.09
931026	1300	2.15	0.113	0.113	8.87	8.87	-30.0	-30.0	-25.8	23.2	23.9	11.8	0.14
931026	1600	2.47	0.103	0.103	9.71	9.71	-30.0	-30.0	-17.4	29.7	27.8	11.0	0.13
931026	1900	3.06	0.103	0.103	9.71	9.71	-28.0	-28.0	0.6	46.6	29.0	12.3	0.11
931026	2200	3.81	0.093	0.103	10.72	9.71	-20.0	-18.0	9.3	40.2	27.7	19.7	0.16
931027	0100	4.17	0.093	0.093	10.72	10.72	-2.0	40.0	22.1	36.6	26.4	17.9	0.20
931027	0400	3.87	0.093	0.093	10.72	10.72	6.0	6.0	18.9	33.1	26.9	24.1	0.20
931027	0700	3.09	0.093	0.093	10.72	10.72	-6.0	10.0	15.0	29.0	23.5	19.5	0.15
931027	1000	2.74	0.093	0.093	10.72	10.72	-2.0	0.0	8.8	22.3	22.3	17.0	0.12
931027	1300	2.50	0.093	0.093	10.72	10.72	8.0	6.0	10.1	21.3	21.6	16.9	0.12

(Sheet 5 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931027	1600	2.29	0.093	0.093	10.72	10.72	2.0	2.0	6.3	19.8	21.0	14.0	0.14
931027	1900	1.95	0.083	0.083	11.98	11.98	8.0	8.0	6.1	19.7	21.1	16.9	0.15
931027	2200	1.63	0.093	0.083	10.72	11.98	-4.0	-2.0	0.7	22.4	22.8	21.0	0.15
931028	0100	1.47	0.093	0.093	10.72	10.72	0.0	2.0	0.8	21.1	21.6	19.1	0.17
931028	0400	1.38	0.093	0.093	10.72	10.72	0.0	2.0	6.2	20.8	21.3	15.4	0.20
931028	0700	1.48	0.083	0.083	11.98	11.98	4.0	6.0	19.7	33.4	18.3	18.1	0.16
931028	1000	1.30	0.093	0.093	10.72	10.72	0.0	4.0	10.7	26.0	18.4	15.8	0.16
931028	1300	1.22	0.093	0.093	10.72	10.72	0.0	10.0	12.7	21.1	18.9	17.5	0.15
931028	1600	1.30	0.093	0.093	10.72	10.72	0.0	0.0	6.6	20.4	19.1	15.0	0.17
931028	1900	1.19	0.093	0.093	10.72	10.72	-8.0	-4.0	-0.1	24.3	21.9	18.5	0.17
931028	2200	1.21	0.083	0.083	11.98	11.98	-12.0	-10.0	-1.9	20.6	18.7	16.4	0.15
931029	0100	1.02	0.083	0.083	11.98	11.98	-10.0	-10.0	-3.8	21.7	21.9	14.8	0.17
931029	0400	0.93	0.093	0.093	10.72	10.72	-12.0	-10.0	-3.4	21.7	24.4	16.6	0.19
931029	0700	0.77	0.093	0.093	10.72	10.72	-10.0	-10.0	-3.1	21.2	23.3	20.1	0.21
931029	1000	0.67	0.083	0.083	11.98	11.98	-8.0	-8.0	-5.8	19.6	21.6	17.5	0.20
931029	1300	0.63	0.093	0.093	10.72	10.72	6.0	2.0	-3.4	20.9	21.7	21.1	0.18
931029	1600	0.59	0.103	0.103	9.71	9.71	-12.0	-10.0	-10.9	25.5	23.8	24.9	0.23
931029	1900	0.55	0.083	0.083	11.98	11.98	-8.0	-4.0	-14.0	24.9	21.5	19.7	0.27
931029	2200	0.49	0.074	0.074	13.56	13.56	-6.0	-4.0	-14.1	23.6	22.5	19.3	0.25
931030	0100	0.45	0.074	0.083	13.56	11.98	-8.0	-10.0	-11.7	23.3	22.5	23.3	0.25
931030	0400	0.45	0.074	0.074	13.56	13.56	4.0	-8.0	-9.4	27.2	25.9	23.6	0.31
931030	0700	0.49	0.074	0.083	13.56	11.98	2.0	-2.0	-14.0	26.2	26.0	24.5	0.23
931030	1000	1.01	0.250	0.250	4.01	4.01	-22.0	-24.0	-29.5	28.9	25.7	21.3	0.16
931030	1300	0.92	0.210	0.210	4.75	4.75	-34.0	-26.0	-29.3	30.8	24.7	20.9	0.15
931030	1600	1.01	0.123	0.123	8.16	8.16	-42.0	-42.0	-38.0	20.8	18.0	9.3	0.15
931030	1900	0.93	0.123	0.123	8.16	8.16	-40.0	-40.0	-42.5	19.0	18.4	5.6	0.16
931030	2200	0.71	0.123	0.103	8.16	9.71	-38.0	-38.0	-38.0	28.4	21.9	16.8	0.16
931031	0100	0.69	0.103	0.093	9.71	10.72	-34.0	-38.0	-35.9	26.9	21.5	30.8	0.14
931031	0400	0.76	0.113	0.103	8.87	9.71	-36.0	-36.0	-39.7	23.3	21.9	16.5	0.16
931031	0700	0.70	0.113	0.113	8.87	8.87	-38.0	-38.0	-39.8	25.7	23.2	10.9	0.17
931031	1000	0.69	0.103	0.103	9.71	9.71	-36.0	-38.0	-39.5	40.4	40.2	11.6	0.15
931031	1300	0.75	0.132	0.132	7.56	7.56	24.0	-40.0	-0.9	63.7	51.3	59.3	0.12
931031	1600	0.68	0.113	0.123	8.87	8.16	-36.0	-40.0	-13.9	65.8	63.3	63.2	0.16
931031	1900	0.54	0.113	0.113	8.87	8.87	-40.0	-42.0	-32.9	64.6	65.3	58.3	0.20
931031	2200	0.45	0.113	0.113	8.87	8.87	-40.0	-42.0	-35.7	54.1	52.2	49.8	0.20
931101	0100	0.41	0.113	0.113	8.87	8.87	-38.0	-38.0	-35.1	45.5	44.3	47.5	0.19
931101	0400	0.38	0.103	0.123	9.71	8.16	-36.0	-38.0	-34.5	46.0	44.5	51.7	0.20
931101	0700	0.34	0.123	0.123	8.16	8.16	-40.0	-38.0	-28.6	54.1	49.9	56.3	0.20
931101	1300	0.53	0.269	0.269	3.72	3.72	70.0	68.0	44.2	35.2	16.4	6.4	0.20
931101	1600	0.63	0.240	0.240	4.17	4.17	66.0	66.0	51.0	25.6	19.1	11.1	0.15
931101	1900	0.67	0.210	0.220	4.75	4.54	56.0	56.0	52.8	23.6	18.2	10.9	0.17
931101	2200	0.72	0.220	0.220	4.54	4.54	58.0	62.0	53.4	21.8	15.3	11.9	0.16
931102	0100	0.93	0.181	0.210	5.52	4.75	42.0	56.0	49.7	23.3	13.4	11.3	0.14
931102	0400	1.20	0.162	0.162	6.19	6.19	32.0	34.0	44.6	20.9	17.9	10.8	0.13
931102	0700	1.19	0.171	0.171	5.83	5.83	36.0	52.0	48.0	22.7	19.6	15.2	0.15
931102	1000	1.08	0.152	0.152	6.59	6.59	26.0	28.0	43.3	26.9	20.7	12.3	0.16
931102	1300	0.95	0.152	0.152	6.59	6.59	24.0	26.0	37.1	26.6	21.4	15.1	0.14
931102	1600	0.93	0.162	0.162	6.19	6.19	30.0	30.0	34.0	27.5	22.5	15.1	0.13
931102	1900	0.83	0.162	0.162	6.19	6.19	26.0	26.0	36.0	30.3	25.7	18.2	0.14
931102	2200	0.71	0.142	0.152	7.04	6.59	22.0	28.0	37.7	33.4	27.9	26.1	0.15
931103	0100	0.62	0.152	0.152	6.59	6.59	22.0	40.0	30.0	33.3	27.8	23.6	0.12
931103	0400	0.55	0.171	0.162	5.83	6.19	38.0	10.0	23.3	34.6	30.5	31.1	0.15
931103	0700	0.50	0.142	0.181	7.04	5.52	6.0	6.0	11.9	33.9	33.7	36.1	0.18
931103	1000	0.41	0.142	0.152	7.04	6.59	12.0	12.0	8.1	33.5	33.9	28.6	0.18
931103	1300	0.36	0.132	0.132	7.56	7.56	12.0	12.0	7.8	33.4	33.2	25.8	0.20
931103	1600	0.30	0.103	0.113	9.71	8.87	-6.0	-14.0	5.6	34.6	35.3	29.5	0.26
931103	1900	0.25	0.064	0.113	15.63	8.87	-12.0	-8.0	-6.4	29.2	30.5	27.6	0.30
931103	2200	0.21	0.064	0.113	15.63	8.87	-14.0	-6.0	-11.7	34.6	35.9	29.6	0.31

(Sheet 6 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931104	0100	0.21	0.074	0.074	13.56	13.56	-10.0	-10.0	-8.7	32.2	32.1	19.9	0.33
931104	0400	0.23	0.074	0.074	13.56	13.56	-12.0	0.0	-6.0	31.4	32.9	23.0	0.31
931104	0700	0.27	0.074	0.074	13.56	13.56	-10.0	-10.0	-5.3	32.4	35.5	24.6	0.32
931104	1000	0.28	0.074	0.074	13.56	13.56	-12.0	-12.0	-13.7	34.8	34.4	20.7	0.28
931104	1300	0.30	0.074	0.074	13.56	13.56	-12.0	-12.0	-17.9	30.2	31.7	16.3	0.23
931104	1600	0.30	0.074	0.074	13.56	13.56	-14.0	-14.0	-17.5	33.4	38.5	24.4	0.27
931104	1900	0.32	0.074	0.074	13.56	13.56	-14.0	-14.0	-21.4	36.8	30.9	21.5	0.26
931104	2200	0.31	0.083	0.083	11.98	11.98	-18.0	-16.0	-20.0	37.5	28.0	20.7	0.22
931105	0100	0.28	0.083	0.083	11.98	11.98	-12.0	-12.0	-23.0	32.8	28.7	19.0	0.23
931105	0400	0.30	0.083	0.083	11.98	11.98	-10.0	-10.0	-18.2	28.0	26.8	16.0	0.24
931105	0700	0.28	0.083	0.083	11.98	11.98	-16.0	-14.0	-20.1	29.2	28.8	20.4	0.25
931105	1000	0.29	0.083	0.083	11.98	11.98	-10.0	-50.0	-29.4	38.5	24.6	23.5	0.24
931105	1300	0.42	0.171	0.171	5.83	5.83	-48.0	-48.0	-43.1	23.1	13.6	5.8	0.18
931105	1600	0.43	0.142	0.142	7.04	7.04	-38.0	-38.0	-40.9	23.5	14.4	4.7	0.18
931105	1900	0.48	0.132	0.142	7.56	7.04	-38.0	-38.0	-37.4	19.2	15.0	7.6	0.18
931105	2200	0.53	0.132	0.132	7.56	7.56	-38.0	-38.0	-41.5	14.3	11.7	4.9	0.16
931106	0100	0.53	0.123	0.123	8.16	8.16	-40.0	-40.0	-43.4	14.2	11.4	5.4	0.16
931106	0400	0.46	0.123	0.123	8.16	8.16	-38.0	-38.0	-42.6	15.6	12.4	5.4	0.17
931106	0700	0.45	0.142	0.132	7.04	7.56	-40.0	-40.0	-42.9	19.4	15.2	9.8	0.16
931106	1000	0.48	0.132	0.132	7.56	7.56	-42.0	-42.0	-43.3	18.0	16.3	9.1	0.16
931106	1300	0.43	0.132	0.132	7.56	7.56	-40.0	-40.0	-42.3	22.4	20.5	15.8	0.16
931106	1600	1.53	0.191	0.191	5.24	5.24	48.0	48.0	45.2	20.7	20.1	11.9	0.16
931106	1900	1.96	0.162	0.152	6.19	6.59	24.0	40.0	37.2	22.2	18.7	18.7	0.18
931106	2200	1.51	0.152	0.152	6.59	6.59	22.0	24.0	35.4	25.0	20.7	15.7	0.17
931107	0100	1.28	0.162	0.162	6.19	6.19	22.0	32.0	33.7	29.8	19.6	15.1	0.16
931107	0400	1.30	0.142	0.142	7.04	7.04	6.0	10.0	29.2	31.3	18.4	12.9	0.14
931107	0700	1.26	0.162	0.162	6.19	6.19	22.0	10.0	32.0	29.6	19.6	13.6	0.12
931107	1000	1.34	0.162	0.152	6.19	6.59	24.0	26.0	34.4	25.7	21.8	17.7	0.15
931107	1300	1.10	0.152	0.152	6.59	6.59	22.0	26.0	34.5	24.3	20.3	14.5	0.15
931107	1600	0.89	0.162	0.162	6.19	6.19	36.0	26.0	34.8	25.4	21.6	14.5	0.14
931107	1900	0.74	0.171	0.171	5.83	5.83	26.0	32.0	30.4	27.8	22.6	15.0	0.12
931107	2200	0.64	0.191	0.181	5.24	5.52	36.0	34.0	28.7	33.7	24.3	13.0	0.14
931108	0100	0.58	0.191	0.191	5.24	5.24	34.0	36.0	24.4	39.7	26.2	13.2	0.15
931108	0400	0.51	0.162	0.162	6.19	6.19	28.0	32.0	23.3	40.6	25.7	17.5	0.18
931108	0700	0.45	0.171	0.171	5.83	5.83	16.0	16.0	14.5	44.4	29.0	23.7	0.16
931108	1000	0.43	0.171	0.142	5.83	7.04	14.0	14.0	9.0	45.2	30.2	32.2	0.17
931108	1300	0.41	0.142	0.142	7.04	7.04	-28.0	18.0	6.1	43.9	33.0	34.8	0.16
931108	1600	0.41	0.142	0.152	7.04	6.59	-34.0	6.0	6.4	43.7	36.5	37.4	0.20
931108	1900	0.44	0.152	0.152	6.59	6.59	-40.0	-4.0	-7.4	36.4	32.9	30.5	0.17
931108	2200	0.53	0.269	0.269	3.72	3.72	2.0	4.0	-3.0	34.0	30.5	25.3	0.15
931109	0100	0.48	0.298	0.298	3.35	3.35	24.0	16.0	4.2	44.7	31.5	23.4	0.17
931109	0400	0.56	0.269	0.279	3.72	3.59	24.0	2.0	2.3	42.6	33.6	30.5	0.15
931109	0700	0.69	0.250	0.250	4.01	4.01	-6.0	8.0	7.7	41.8	32.8	27.8	0.12
931109	1000	0.70	0.230	0.220	4.35	4.54	16.0	-6.0	5.1	35.1	33.3	25.1	0.12
931109	1300	0.88	0.210	0.210	4.75	4.75	44.0	48.0	22.0	57.6	46.4	40.7	0.13
931109	1600	1.52	0.191	0.181	5.24	5.52	42.0	42.0	19.0	53.4	35.5	24.8	0.12
931109	1900	1.65	0.171	0.171	5.83	5.83	18.0	26.0	17.2	30.7	27.2	16.2	0.11
931109	2200	1.71	0.171	0.162	5.83	6.19	20.0	24.0	22.0	31.7	30.7	44.4	0.12
931110	0100	1.74	0.162	0.162	6.19	6.19	24.0	26.0	25.2	32.0	29.1	27.1	0.16
931110	0400	1.78	0.162	0.152	6.19	6.59	16.0	18.0	25.2	34.6	27.0	31.8	0.19
931110	0700	1.96	0.142	0.152	7.04	6.59	6.0	6.0	17.2	41.3	28.3	35.7	0.14
931110	1000	1.91	0.142	0.142	7.04	7.04	6.0	8.0	20.7	37.7	28.5	33.6	0.13
931110	1300	1.84	0.142	0.142	7.04	7.04	10.0	14.0	26.4	39.4	29.6	35.9	0.18
931110	1600	1.68	0.152	0.142	6.59	7.04	18.0	18.0	28.8	33.8	26.1	38.3	0.20
931110	1900	1.62	0.142	0.142	7.04	7.04	16.0	20.0	25.0	29.8	24.3	30.1	0.14
931110	2200	1.56	0.142	0.142	7.04	7.04	12.0	16.0	24.8	31.6	25.1	26.2	0.13
931111	0100	1.60	0.132	0.132	7.56	7.56	10.0	12.0	21.9	31.9	27.0	22.8	0.18
931111	0400	1.45	0.123	0.132	8.16	7.56	18.0	16.0	15.1	31.6	27.7	23.7	0.21

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931111	0700	1.34	0.103	0.103	9.71	9.71	-6.0	12.0	12.3	33.8	29.6	23.8	0.17
931111	1000	1.27	0.103	0.103	9.71	9.71	-6.0	10.0	7.0	29.2	27.9	25.8	0.15
931111	1300	1.21	0.103	0.103	9.71	9.71	-2.0	10.0	11.3	29.8	29.6	24.4	0.15
931111	1600	1.21	0.093	0.093	10.72	10.72	10.0	8.0	8.4	27.7	28.7	21.5	0.19
931111	1900	1.08	0.093	0.093	10.72	10.72	0.0	2.0	4.4	21.9	24.2	13.7	0.19
931111	2200	1.01	0.093	0.093	10.72	10.72	6.0	4.0	2.6	24.3	25.8	18.5	0.14
931112	0100	1.13	0.103	0.103	9.71	9.71	4.0	0.0	-1.1	22.4	23.8	19.0	0.20
931112	0400	1.23	0.093	0.093	10.72	10.72	0.0	-4.0	-6.2	22.9	23.9	20.1	0.25
931112	0700	1.07	0.103	0.103	9.71	9.71	-4.0	-6.0	-9.2	23.1	23.3	19.3	0.23
931112	1000	0.90	0.103	0.103	9.71	9.71	-2.0	-4.0	-8.6	23.6	23.5	21.3	0.15
931112	1300	0.86	0.103	0.103	9.71	9.71	-2.0	-6.0	-7.6	22.5	22.6	20.2	0.16
931112	1600	0.83	0.093	0.103	10.72	9.71	-6.0	-6.0	-11.4	21.9	22.0	20.2	0.24
931112	1900	0.82	0.093	0.093	10.72	10.72	-4.0	-6.0	-11.6	23.7	23.5	20.1	0.20
931112	2200	0.72	0.103	0.103	9.71	9.71	-14.0	-12.0	-14.2	22.4	21.9	20.1	0.14
931113	0100	0.74	0.103	0.103	9.71	9.71	-2.0	-16.0	-15.1	24.0	23.6	20.7	0.18
931113	0400	0.70	0.103	0.103	9.71	9.71	-6.0	-6.0	-17.3	26.7	25.0	18.8	0.32
931113	0700	0.65	0.103	0.103	9.71	9.71	-4.0	-6.0	-17.2	28.2	26.5	23.9	0.27
931113	1000	0.56	0.103	0.103	9.71	9.71	-12.0	-12.0	-21.6	26.6	26.5	21.4	0.21
931113	1300	0.54	0.103	0.103	9.71	9.71	-8.0	-10.0	-15.9	27.3	26.3	23.1	0.18
931113	1600	0.53	0.113	0.113	8.87	8.87	-12.0	-12.0	-21.9	28.8	26.1	21.9	0.28
931113	1900	0.50	0.123	0.103	8.16	9.71	-18.0	-38.0	-28.7	33.2	27.0	29.3	0.31
931113	2200	0.53	0.123	0.113	8.16	8.87	-36.0	-36.0	-32.1	32.0	23.2	29.9	0.17
931114	0100	0.56	0.113	0.113	8.87	8.87	-30.0	-34.0	-33.7	32.1	25.5	24.2	0.15
931114	0400	0.56	0.132	0.113	7.56	8.87	-20.0	-36.0	-38.2	35.2	28.8	30.4	0.22
931114	0700	0.52	0.123	0.113	8.16	8.87	-36.0	-38.0	-35.7	34.1	28.4	24.9	0.23
931114	1000	0.44	0.113	0.113	8.87	8.87	-26.0	-36.0	-34.0	32.1	27.6	25.2	0.25
931114	1300	0.44	0.113	0.113	8.87	8.87	-10.0	-34.0	-26.2	32.6	28.7	23.5	0.17
931114	1600	0.49	0.103	0.103	9.71	9.71	-16.0	-36.0	-32.8	26.2	21.1	20.1	0.26
931114	1900	0.50	0.103	0.103	9.71	9.71	-32.0	-38.0	-32.8	26.7	21.6	22.0	0.27
931114	2200	0.48	0.103	0.103	9.71	9.71	-30.0	-36.0	-35.9	23.2	21.2	22.0	0.21
931115	0100	0.49	0.113	0.103	8.87	9.71	-28.0	-36.0	-30.1	23.3	19.4	21.0	0.16
931115	0400	0.52	0.103	0.103	9.71	9.71	-28.0	-36.0	-36.6	22.6	19.1	21.7	0.23
931115	0700	0.54	0.162	0.103	6.19	9.71	-42.0	-50.0	-41.2	25.1	15.6	20.5	0.24
931115	1000	0.50	0.191	0.103	5.24	9.71	-50.0	-50.0	-41.7	25.9	13.9	20.0	0.23
931115	1300	0.48	0.191	0.103	5.24	9.71	-48.0	-48.0	-40.4	24.8	13.4	22.3	0.13
931115	1600	0.52	0.181	0.103	5.52	9.71	-46.0	-44.0	-40.9	24.7	13.5	22.6	0.19
931115	1900	0.50	0.152	0.162	6.59	6.19	-42.0	-42.0	-42.6	26.8	15.9	9.0	0.21
931115	2200	0.49	0.152	0.093	6.59	10.72	-44.0	-44.0	-41.2	29.8	17.7	26.2	0.20
931116	0100	0.44	0.152	0.103	6.59	9.71	-42.0	-38.0	-38.1	27.4	18.4	20.3	0.17
931116	0400	0.48	0.162	0.103	6.19	9.71	-42.0	-40.0	-32.7	28.2	22.9	23.5	0.21
931116	0700	1.05	0.220	0.220	4.54	4.54	40.0	36.0	32.8	33.4	29.5	21.0	0.14
931116	1000	1.07	0.201	0.191	4.98	5.24	44.0	46.0	34.1	34.3	27.6	23.6	0.15
931116	1300	1.17	0.152	0.181	6.59	5.52	14.0	14.0	30.7	31.5	25.2	23.2	0.12
931116	1600	1.09	0.171	0.171	5.83	5.83	12.0	12.0	26.6	34.4	28.7	16.3	0.11
931116	1900	1.05	0.171	0.171	5.83	5.83	24.0	24.0	23.7	36.1	31.2	20.5	0.14
931116	2200	0.95	0.152	0.152	6.59	6.59	18.0	22.0	21.4	44.9	29.7	24.1	0.16
931117	0100	0.84	0.162	0.132	6.19	7.56	16.0	26.0	16.8	48.4	28.6	19.8	0.13
931117	0400	0.79	0.142	0.142	7.04	7.04	-10.0	-12.0	10.2	49.2	30.8	18.8	0.11
931117	0700	0.77	0.142	0.142	7.04	7.04	-16.0	2.0	9.6	47.2	33.4	19.4	0.18
931117	1000	0.68	0.142	0.113	7.04	8.87	2.0	2.0	7.1	42.3	35.3	27.8	0.20
931117	1300	0.60	0.113	0.123	8.87	8.16	-26.0	-26.0	-1.3	41.7	35.9	26.5	0.16
931117	1600	0.57	0.113	0.132	8.87	7.56	-26.0	-14.0	-15.1	38.4	39.4	24.7	0.15
931117	1900	0.59	0.123	0.113	8.16	8.87	-38.0	-38.0	-39.1	45.0	37.3	27.1	0.16
931117	2200	0.61	0.181	0.181	5.52	5.52	-54.0	-56.0	-50.3	33.5	21.1	11.3	0.18
931118	0100	0.56	0.171	0.123	5.83	8.16	-54.0	-44.0	-47.9	28.1	15.7	18.1	0.20
931118	0400	0.45	0.132	0.113	7.56	8.87	-40.0	-38.0	-45.2	28.3	18.3	17.3	0.19
931118	0700	0.89	0.230	0.240	4.35	4.17	58.0	58.0	42.2	21.9	19.1	14.5	0.18
931118	1000	1.58	0.181	0.181	5.52	5.52	48.0	48.0	45.8	15.7	16.0	10.9	0.20

(Sheet 8 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931118	1300	1.56	0.171	0.171	5.83	5.83	42.0	44.0	41.4	21.3	20.2	15.4	0.18
931118	1600	1.67	0.162	0.152	6.19	6.59	30.0	32.0	35.6	21.7	20.7	15.0	0.15
931118	1900	1.64	0.162	0.152	6.19	6.59	26.0	24.0	30.5	25.4	25.9	16.5	0.14
931118	2200	1.56	0.152	0.152	6.59	6.59	34.0	24.0	30.2	30.6	30.7	16.0	0.13
931119	0100	1.33	0.132	0.152	7.56	6.59	16.0	14.0	26.0	33.7	31.9	23.8	0.13
931119	0400	1.23	0.142	0.132	7.04	7.56	14.0	12.0	21.8	30.3	28.8	24.0	0.11
931119	0700	1.22	0.152	0.152	6.59	6.59	8.0	12.0	15.7	31.7	30.2	18.5	0.13
931119	1000	1.27	0.142	0.142	7.04	7.04	10.0	12.0	16.1	38.0	36.1	23.1	0.16
931119	1300	1.14	0.142	0.142	7.04	7.04	14.0	12.0	17.6	38.1	37.0	22.3	0.17
931119	1600	1.07	0.123	0.123	8.16	8.16	6.0	8.0	15.0	33.8	35.1	23.4	0.14
931119	1900	1.07	0.113	0.113	8.87	8.87	2.0	4.0	11.1	28.6	31.0	15.9	0.16
931119	2200	0.87	0.113	0.113	8.87	8.87	0.0	4.0	11.0	35.2	37.4	21.8	0.27
931120	0100	0.74	0.103	0.103	9.71	9.71	10.0	10.0	11.4	37.9	40.0	28.0	0.28
931120	0400	0.60	0.103	0.103	9.71	9.71	6.0	6.0	-2.1	35.8	36.9	30.4	0.26
931120	0700	0.54	0.113	0.113	8.87	8.87	4.0	4.0	-6.2	35.7	34.8	31.6	0.24
931120	1000	0.51	0.123	0.113	8.16	8.87	8.0	-38.0	-14.7	41.3	38.4	35.8	0.26
931120	1300	0.53	0.103	0.113	9.71	8.87	-34.0	-36.0	-2.8	53.0	35.3	37.2	0.28
931120	1600	0.54	0.113	0.113	8.87	8.87	8.0	56.0	8.7	64.0	31.7	35.1	0.24
931120	1900	0.65	0.298	0.113	3.35	8.87	60.0	58.0	24.7	59.6	25.8	33.2	0.20
931120	2200	0.86	0.181	0.191	5.52	5.24	40.0	42.0	36.6	35.5	19.7	8.8	0.16
931121	0100	1.06	0.181	0.181	5.52	5.52	42.0	44.0	39.2	28.1	21.3	13.8	0.18
931121	0400	1.31	0.152	0.171	6.59	5.83	22.0	28.0	32.8	24.5	21.0	16.8	0.15
931121	0700	1.21	0.142	0.152	7.04	6.59	20.0	24.0	27.9	26.0	22.9	14.0	0.13
931121	1000	1.05	0.152	0.152	6.59	6.59	26.0	28.0	25.0	28.1	25.4	12.6	0.13
931121	1300	0.87	0.162	0.171	6.19	5.83	30.0	28.0	21.8	32.7	27.9	16.7	0.15
931121	1600	0.74	0.113	0.191	8.87	5.24	-34.0	32.0	22.4	41.7	31.7	23.0	0.15
931121	1900	0.73	0.162	0.123	6.19	8.16	32.0	30.0	14.7	47.0	39.8	33.7	0.13
931121	2200	0.75	0.123	0.240	8.16	4.17	-34.0	-10.0	-6.7	45.6	47.0	59.3	0.14
931122	0100	0.74	0.123	0.240	8.16	4.17	-34.0	-14.0	-16.7	43.7	44.5	48.1	0.15
931122	0400	0.74	0.201	0.201	4.98	4.98	-50.0	-36.0	-37.6	41.8	41.6	40.8	0.14
931122	0700	0.70	0.123	0.113	8.16	8.87	-34.0	-36.0	-37.1	34.8	35.0	24.0	0.14
931122	1000	0.69	0.132	0.113	7.56	8.87	-36.0	-36.0	-36.5	33.3	32.9	24.5	0.14
931122	1300	0.66	0.123	0.113	8.16	8.87	-36.0	-38.0	-33.1	32.7	32.8	26.5	0.17
931122	1600	0.69	0.113	0.113	8.87	8.87	-34.0	-38.0	-25.9	32.2	31.3	20.6	0.18
931122	1900	0.79	0.113	0.113	8.87	8.87	-38.0	-38.0	-20.8	34.5	29.7	25.8	0.15
931122	2200	0.92	0.113	0.113	8.87	8.87	-26.0	-38.0	-24.9	31.9	27.6	24.3	0.14
931123	0100	1.06	0.113	0.113	8.87	8.87	-30.0	-36.0	-19.5	32.2	27.3	23.9	0.13
931123	0400	1.17	0.113	0.113	8.87	8.87	-28.0	-14.0	-12.5	32.8	27.2	18.6	0.12
931123	0700	1.33	0.132	0.132	7.56	7.56	-34.0	-4.0	-8.3	29.3	27.9	23.2	0.10
931123	1000	1.41	0.132	0.132	7.56	7.56	-4.0	-4.0	-8.0	29.9	30.2	23.8	0.09
931123	1300	1.44	0.113	0.123	8.87	8.16	-22.0	-22.0	-8.8	29.8	30.3	22.6	0.11
931123	1600	1.39	0.123	0.123	8.16	8.16	-8.0	-16.0	-4.3	31.6	30.5	22.1	0.13
931123	1900	1.39	0.113	0.113	8.87	8.87	-10.0	-10.0	-6.7	27.9	28.6	21.3	0.11
931123	2200	1.51	0.113	0.113	8.87	8.87	-10.0	-10.0	1.2	31.7	26.9	20.8	0.11
931124	0100	1.64	0.113	0.113	8.87	8.87	-14.0	-14.0	4.1	33.6	29.7	21.6	0.13
931124	0400	1.52	0.103	0.103	9.71	9.71	-18.0	-10.0	0.9	29.4	29.5	19.2	0.13
931124	0700	1.56	0.113	0.113	8.87	8.87	-14.0	-12.0	-5.4	26.6	27.3	21.7	0.11
931124	1000	1.52	0.113	0.113	8.87	8.87	-6.0	-8.0	-4.7	24.3	25.4	22.0	0.10
931124	1300	1.33	0.113	0.113	8.87	8.87	-6.0	-8.0	-7.3	29.4	27.6	23.6	0.13
931124	1600	1.27	0.103	0.113	9.71	8.87	-8.0	-8.0	-3.7	30.9	27.2	26.7	0.14
931124	1900	1.16	0.113	0.113	8.87	8.87	-12.0	-10.0	-5.7	30.8	26.0	19.3	0.12
931124	2200	1.14	0.113	0.123	8.87	8.16	-2.0	-6.0	-1.3	31.7	28.1	25.6	0.11
931125	0100	1.40	0.123	0.123	8.16	8.16	-8.0	-6.0	11.1	46.5	27.7	22.9	0.15
931125	0400	1.59	0.191	0.191	5.24	5.24	14.0	32.0	10.2	41.8	27.9	22.2	0.12
931125	0700	1.72	0.162	0.162	6.19	6.19	2.0	2.0	14.6	35.6	27.9	19.0	0.11
931125	1000	2.03	0.152	0.152	6.59	6.59	16.0	10.0	16.8	33.6	28.1	21.4	0.10
931125	1300	2.30	0.132	0.132	7.56	7.56	10.0	12.0	19.2	31.9	28.7	25.0	0.12
931125	1600	2.96	0.123	0.123	8.16	8.16	18.0	16.0	20.3	26.8	27.2	19.2	0.16

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931125	1900	3.29	0.123	0.113	8.16	8.87	10.0	12.0	17.1	26.4	26.5	22.8	0.16
931125	2200	3.28	0.132	0.093	7.56	10.72	12.0	12.0	12.9	26.0	26.2	18.1	0.15
931126	0100	2.75	0.093	0.093	10.72	10.72	-2.0	10.0	12.2	30.4	28.9	23.1	0.14
931126	0400	2.35	0.103	0.093	9.71	10.72	12.0	10.0	12.7	31.7	30.5	24.5	0.15
931126	0700	2.11	0.093	0.093	10.72	10.72	-4.0	-4.0	12.4	31.9	29.6	16.5	0.15
931126	1000	1.93	0.093	0.103	10.72	9.71	-2.0	0.0	10.0	30.2	29.8	25.9	0.11
931126	1300	1.95	0.123	0.103	8.16	9.71	8.0	6.0	5.8	31.0	30.9	26.0	0.12
931126	1600	1.98	0.142	0.103	7.04	9.71	10.0	8.0	10.1	32.3	30.7	26.1	0.13
931126	1900	1.89	0.103	0.103	9.71	9.71	0.0	6.0	7.4	32.0	30.4	24.2	0.13
931126	2200	1.81	0.103	0.103	9.71	9.71	-6.0	6.0	9.4	32.7	31.3	22.4	0.11
931127	0100	1.83	0.142	0.103	7.04	9.71	4.0	6.0	9.1	31.8	34.1	24.9	0.12
931127	0400	1.99	0.123	0.123	8.16	8.16	6.0	-6.0	-4.9	32.7	35.4	28.2	0.14
931127	0700	2.51	0.123	0.113	8.16	8.87	-14.0	-12.0	-11.6	31.9	33.4	29.8	0.15
931127	1000	2.64	0.103	0.103	9.71	9.71	-16.0	-10.0	-13.4	31.4	32.3	25.8	0.16
931127	1300	2.76	0.103	0.103	9.71	9.71	-12.0	-16.0	-20.1	32.3	32.3	25.8	0.17
931127	1600	2.89	0.103	0.103	9.71	9.71	-22.0	-18.0	-21.5	31.0	31.0	26.6	0.20
931127	1900	2.91	0.103	0.103	9.71	9.71	-18.0	-16.0	-23.3	30.8	30.6	24.0	0.22
931127	2200	3.14	0.093	0.093	10.72	10.72	-10.0	-16.0	-17.4	25.9	26.9	25.0	0.22
931128	0100	3.45	0.093	0.093	10.72	10.72	-18.0	-16.0	-23.9	24.5	25.4	23.7	0.24
931128	0400	3.49	0.093	0.093	10.72	10.72	-12.0	-16.0	-23.9	28.1	26.9	25.4	0.27
931128	0700	3.14	0.093	0.093	10.72	10.72	-36.0	-18.0	-25.0	24.9	25.7	23.5	0.23
931128	1000	2.80	0.083	0.083	11.98	11.98	-18.0	-20.0	-19.7	21.3	22.1	22.0	0.22
931128	1300	2.65	0.093	0.083	10.72	11.98	-32.0	-14.0	-18.5	24.0	23.4	24.3	0.19
931128	1600	2.49	0.083	0.093	11.98	10.72	-8.0	-12.0	-12.8	25.6	26.1	29.1	0.18
931128	1900	2.28	0.093	0.093	10.72	10.72	-16.0	-12.0	-14.1	27.0	27.3	24.8	0.19
931128	2200	1.95	0.093	0.093	10.72	10.72	-28.0	-18.0	-24.3	24.0	24.2	22.2	0.16
931129	0100	1.78	0.083	0.093	11.98	10.72	-32.0	-14.0	-14.8	27.7	26.6	26.0	0.12
931129	0400	1.76	0.093	0.083	10.72	11.98	-22.0	-20.0	-8.6	30.0	27.4	26.5	0.14
931129	0700	1.65	0.093	0.093	10.72	10.72	-4.0	-14.0	-3.7	29.2	28.7	25.2	0.20
931129	1000	1.57	0.093	0.093	10.72	10.72	-12.0	-14.0	-4.0	29.9	27.5	22.8	0.15
931129	1300	1.54	0.093	0.093	10.72	10.72	-10.0	-12.0	2.2	30.4	29.8	24.7	0.12
931129	1600	1.57	0.093	0.093	10.72	10.72	-4.0	-8.0	0.2	29.1	28.5	22.7	0.14
931129	1900	1.34	0.093	0.093	10.72	10.72	-8.0	-8.0	-5.6	29.1	27.8	25.0	0.17
931129	2200	1.26	0.093	0.093	10.72	10.72	2.0	-6.0	-0.9	28.6	27.6	27.5	0.17
931130	0100	1.26	0.093	0.093	10.72	10.72	0.0	-4.0	-8.4	28.4	26.8	26.1	0.14
931130	0400	1.25	0.093	0.093	10.72	10.72	-6.0	-8.0	-6.9	27.5	26.8	25.2	0.18
931130	0700	1.24	0.093	0.093	10.72	10.72	-14.0	-18.0	-5.7	35.0	26.8	27.9	0.25
931130	1000	1.71	0.181	0.093	5.52	10.72	46.0	48.0	29.5	47.2	22.5	29.5	0.18
931130	1300	1.63	0.162	0.093	6.19	10.72	28.0	40.0	24.1	45.4	21.9	28.8	0.17
931130	1600	1.53	0.093	0.093	10.72	10.72	2.0	36.0	19.5	48.7	23.1	27.9	0.17
931130	1900	1.53	0.103	0.093	9.71	10.72	-10.0	30.0	19.8	45.1	23.8	27.7	0.16
931130	2200	1.62	0.171	0.103	5.83	9.71	22.0	28.0	17.8	37.9	24.6	27.7	0.13
931201	0100	1.61	0.171	0.171	5.83	5.83	22.0	18.0	16.7	38.2	24.9	20.7	0.13
931201	0400	1.58	0.162	0.171	6.19	5.83	22.0	14.0	19.1	39.4	26.8	21.5	0.10
931201	0700	1.66	0.162	0.162	6.19	6.19	18.0	20.0	18.5	35.6	26.1	17.3	0.13
931201	1000	1.70	0.171	0.171	5.83	5.83	16.0	16.0	16.6	33.7	25.3	19.3	0.13
931201	1300	1.75	0.162	0.162	6.19	6.19	16.0	12.0	13.8	31.0	23.6	15.6	0.10
931201	1600	1.74	0.162	0.162	6.19	6.19	14.0	4.0	11.4	31.7	24.2	17.5	0.11
931201	1900	1.81	0.142	0.152	7.04	6.59	6.0	6.0	13.3	30.7	25.0	22.1	0.13
931201	2200	1.69	0.142	0.142	7.04	7.04	8.0	8.0	10.6	26.7	23.8	13.5	0.12
931202	0100	1.80	0.152	0.103	6.59	9.71	8.0	6.0	11.5	27.1	24.4	23.6	0.10
931202	0400	1.75	0.113	0.113	8.87	8.87	-2.0	0.0	9.0	29.4	27.4	22.0	0.11
931202	0700	1.71	0.113	0.103	8.87	9.71	-18.0	4.0	7.9	30.1	29.0	25.7	0.13
931202	1000	1.59	0.103	0.103	9.71	9.71	2.0	2.0	6.3	30.6	29.7	26.6	0.13
931202	1300	1.51	0.103	0.103	9.71	9.71	4.0	4.0	7.4	29.4	27.9	24.2	0.11
931202	1600	1.56	0.103	0.103	9.71	9.71	-12.0	4.0	4.8	29.7	26.8	21.6	0.12
931202	1900	1.62	0.103	0.103	9.71	9.71	-6.0	-6.0	3.1	28.7	25.0	19.4	0.14
931202	2200	1.48	0.103	0.103	9.71	9.71	-8.0	4.0	3.4	27.9	26.6	20.7	0.14

(Sheet 10 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931203	0100	1.41	0.103	0.103	9.71	9.71	-8.0	-8.0	-0.8	26.2	25.7	19.0	0.12
931203	0400	1.34	0.103	0.103	9.71	9.71	-4.0	-4.0	-1.9	26.8	26.5	22.2	0.12
931203	0700	1.20	0.103	0.103	9.71	9.71	2.0	-8.0	-1.9	28.5	27.3	25.1	0.16
931203	1000	1.01	0.103	0.103	9.71	9.71	-4.0	-4.0	-1.6	30.0	28.6	23.8	0.19
931203	1300	0.90	0.113	0.113	8.87	8.87	-10.0	4.0	-0.2	29.7	27.6	23.0	0.15
931203	1600	0.87	0.113	0.113	8.87	8.87	0.0	-2.0	1.2	29.1	27.5	23.5	0.12
931203	1900	0.84	0.113	0.113	8.87	8.87	-4.0	-2.0	-2.1	31.6	29.0	27.4	0.21
931203	2200	0.78	0.113	0.113	8.87	8.87	-10.0	-12.0	-4.4	32.0	29.2	24.0	0.22
931204	0100	0.76	0.113	0.113	8.87	8.87	-8.0	-10.0	-7.3	30.0	28.9	25.3	0.19
931204	0400	0.76	0.113	0.113	8.87	8.87	-6.0	-6.0	-7.6	29.7	29.3	26.7	0.16
931204	0700	0.73	0.113	0.113	8.87	8.87	-22.0	-18.0	-12.8	30.3	30.6	27.6	0.20
931204	1000	0.71	0.113	0.113	8.87	8.87	-6.0	-6.0	-8.6	32.3	32.5	29.9	0.23
931204	1300	0.65	0.113	0.113	8.87	8.87	-4.0	-8.0	-6.3	33.9	34.2	28.7	0.22
931204	1600	0.65	0.113	0.113	8.87	8.87	-12.0	-14.0	-17.0	31.5	31.9	28.1	0.17
931204	1900	0.66	0.113	0.113	8.87	8.87	-22.0	-22.0	-25.7	32.1	32.5	29.1	0.18
931204	2200	0.68	0.103	0.113	9.71	8.87	-16.0	-20.0	-27.9	36.9	30.4	31.0	0.25
931205	0100	0.73	0.103	0.103	9.71	9.71	-18.0	-40.0	-28.2	36.2	24.9	26.1	0.22
931205	0400	0.89	0.123	0.113	8.16	8.87	-38.0	-40.0	-39.1	29.6	27.6	30.4	0.17
931205	0700	1.11	0.123	0.113	8.16	8.87	-38.0	-40.0	-34.4	23.5	20.4	25.9	0.20
931205	1000	0.94	0.132	0.113	7.56	8.87	-38.0	-40.0	-39.7	24.7	18.9	20.3	0.27
931205	1300	0.75	0.103	0.103	9.71	9.71	-36.0	68.0	-1.7	98.9	23.9	28.7	0.39
931205	1600	0.97	0.181	0.181	5.52	5.52	50.0	54.0	39.6	19.9	13.5	5.6	0.21
931205	1900	0.99	0.181	0.181	5.52	5.52	48.0	48.0	44.5	20.3	13.2	5.1	0.22
931205	2200	1.12	0.162	0.142	6.19	7.04	42.0	42.0	38.4	28.4	14.0	11.1	0.23
931206	0100	1.38	0.132	0.132	7.56	7.56	20.0	20.0	33.8	25.8	13.9	6.7	0.20
931206	0400	1.27	0.132	0.113	7.56	8.87	20.0	22.0	28.6	24.5	18.1	17.1	0.17
931206	0700	1.21	0.123	0.123	8.16	8.16	18.0	18.0	24.8	23.3	19.6	14.4	0.15
931206	1000	1.09	0.103	0.103	9.71	9.71	16.0	18.0	25.8	25.9	23.0	22.1	0.18
931206	1300	0.95	0.103	0.103	9.71	9.71	14.0	16.0	21.4	28.3	23.5	20.2	0.20
931206	1600	0.87	0.103	0.103	9.71	9.71	6.0	12.0	16.7	25.6	23.0	17.9	0.20
931206	1900	0.86	0.093	0.093	10.72	10.72	12.0	12.0	14.2	23.3	22.9	17.1	0.14
931206	2200	0.87	0.103	0.103	9.71	9.71	10.0	10.0	11.8	21.4	20.9	12.1	0.22
931207	0100	0.81	0.103	0.103	9.71	9.71	14.0	14.0	10.6	22.6	22.1	18.2	0.25
931207	0400	0.89	0.093	0.103	10.72	9.71	2.0	54.0	24.9	40.2	17.5	18.5	0.23
931207	0700	1.33	0.191	0.191	5.24	5.24	48.0	50.0	39.9	31.0	16.8	10.7	0.20
931207	1000	1.32	0.181	0.181	5.52	5.52	46.0	50.0	39.3	30.3	19.3	13.6	0.20
931207	1300	1.11	0.171	0.171	5.83	5.83	34.0	34.0	29.1	35.9	20.8	13.2	0.16
931207	1600	0.93	0.093	0.093	10.72	10.72	6.0	32.0	23.3	37.4	21.9	19.6	0.15
931207	1900	0.88	0.083	0.093	11.98	10.72	-6.0	-4.0	16.0	36.0	22.6	20.1	0.13
931207	2200	0.84	0.093	0.093	10.72	10.72	-10.0	-10.0	9.8	35.7	25.8	26.6	0.15
931208	0100	0.77	0.093	0.093	10.72	10.72	4.0	-12.0	7.7	31.8	27.9	21.1	0.24
931208	0400	0.71	0.093	0.093	10.72	10.72	-14.0	-12.0	4.5	29.3	28.8	21.2	0.20
931208	0700	0.67	0.093	0.093	10.72	10.72	-14.0	6.0	1.2	29.2	28.9	20.9	0.16
931208	1000	0.65	0.093	0.093	10.72	10.72	0.0	0.0	5.0	26.3	27.2	18.6	0.19
931208	1300	0.60	0.093	0.093	10.72	10.72	-16.0	-2.0	-3.0	26.1	27.6	20.0	0.28
931208	1600	0.56	0.093	0.093	10.72	10.72	-4.0	-6.0	-4.1	24.4	25.2	17.8	0.37
931208	1900	0.53	0.103	0.103	9.71	9.71	-10.0	-10.0	-3.4	24.9	25.8	19.9	0.16
931208	2200	0.60	0.103	0.103	9.71	9.71	-12.0	-10.0	8.2	39.1	23.5	21.8	0.19
931209	0100	0.69	0.103	0.103	9.71	9.71	-4.0	50.0	25.9	50.4	22.2	20.6	0.19
931209	0400	0.69	0.240	0.103	4.17	9.71	46.0	48.0	26.3	48.1	22.3	21.5	0.16
931209	0700	0.64	0.103	0.103	9.71	9.71	4.0	28.0	22.6	42.1	23.6	24.8	0.13
931209	1000	0.58	0.240	0.113	4.17	8.87	48.0	32.0	17.6	45.6	25.5	27.6	0.13
931209	1300	0.53	0.103	0.113	9.71	8.87	2.0	2.0	12.4	46.2	26.6	30.7	0.19
931209	1600	0.48	0.103	0.103	9.71	9.71	4.0	6.0	12.2	40.8	30.2	33.1	0.20
931209	1900	0.47	0.113	0.113	8.87	8.87	2.0	0.0	4.9	37.7	30.0	32.7	0.18
931209	2200	0.48	0.113	0.113	8.87	8.87	-20.0	4.0	-0.2	33.3	29.3	29.3	0.18
931210	0100	0.47	0.113	0.113	8.87	8.87	-18.0	2.0	-6.3	31.7	31.5	26.2	0.22
931210	0400	0.46	0.103	0.113	9.71	8.87	2.0	2.0	-13.0	30.6	30.4	29.9	0.22

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931210	0700	0.47	0.113	0.103	8.87	9.71	-16.0	-12.0	-11.9	29.2	28.7	26.5	0.24
931210	1000	0.49	0.103	0.113	9.71	8.87	-4.0	-4.0	-7.9	28.8	27.1	28.9	0.17
931210	1300	0.54	0.113	0.113	8.87	8.87	-12.0	-14.0	-14.1	34.7	25.4	25.1	0.23
931210	1600	0.52	0.103	0.113	9.71	8.87	-14.0	-14.0	-15.6	35.2	27.0	26.2	0.25
931210	1900	0.50	0.103	0.103	9.71	9.71	-22.0	-2.0	-20.9	37.7	27.3	26.8	0.30
931210	2200	0.52	0.074	0.074	13.56	13.56	4.0	-10.0	-27.7	41.0	24.3	22.3	0.17
931211	0100	0.53	0.201	0.074	4.98	13.56	-50.0	-52.0	-31.3	42.3	19.4	23.7	0.24
931211	0400	0.48	0.074	0.074	13.56	13.56	-4.0	-40.0	-28.7	39.3	22.3	20.6	0.22
931211	0700	0.80	0.210	0.269	4.75	3.72	44.0	52.0	31.1	47.0	18.8	15.5	0.25
931211	1000	1.39	0.171	0.171	5.83	5.83	40.0	40.0	39.9	19.2	15.4	8.6	0.20
931211	1300	1.35	0.152	0.152	6.59	6.59	32.0	38.0	35.8	21.9	15.1	9.7	0.21
931211	1600	1.50	0.152	0.152	6.59	6.59	30.0	38.0	38.3	24.6	14.3	9.6	0.27
931211	1900	1.76	0.152	0.152	6.59	6.59	32.0	40.0	36.3	21.3	14.2	10.5	0.27
931211	2200	1.63	0.142	0.142	7.04	7.04	24.0	36.0	34.5	21.1	12.7	8.9	0.23
931212	0100	1.66	0.142	0.142	7.04	7.04	24.0	24.0	33.5	23.2	12.6	11.9	0.25
931212	0400	1.79	0.132	0.132	7.56	7.56	22.0	24.0	36.3	23.8	13.0	9.1	0.27
931212	0700	1.82	0.123	0.132	8.16	7.56	22.0	52.0	34.8	23.9	12.7	10.9	0.27
931212	1000	1.74	0.132	0.132	7.56	7.56	22.0	24.0	32.9	22.3	13.8	10.7	0.22
931212	1300	1.62	0.132	0.132	7.56	7.56	22.0	22.0	31.2	23.5	15.6	9.0	0.18
931212	1600	1.55	0.132	0.142	7.56	7.04	22.0	24.0	31.8	24.6	15.4	12.4	0.22
931212	1900	1.54	0.132	0.132	7.56	7.56	26.0	26.0	30.5	23.7	16.2	10.3	0.20
931212	2200	1.59	0.142	0.132	7.04	7.56	24.0	24.0	29.1	24.8	16.6	12.8	0.17
931213	0100	1.63	0.142	0.132	7.04	7.56	24.0	24.0	24.2	25.9	19.4	18.1	0.14
931213	0400	1.63	0.142	0.142	7.04	7.04	24.0	24.0	24.7	26.3	19.1	10.0	0.18
931213	0700	1.67	0.142	0.142	7.04	7.04	24.0	24.0	25.5	24.3	19.1	13.9	0.19
931213	1000	1.70	0.074	0.074	13.56	13.56	-10.0	22.0	22.8	28.3	18.6	19.2	0.15
931213	1300	1.69	0.074	0.074	13.56	13.56	-2.0	22.0	21.5	30.1	19.8	17.4	0.15
931213	1600	1.62	0.074	0.083	13.56	11.98	-14.0	18.0	16.0	26.9	20.0	20.1	0.15
931213	1900	1.54	0.083	0.083	11.98	11.98	8.0	10.0	16.1	26.3	20.3	22.6	0.21
931213	2200	1.66	0.083	0.083	11.98	11.98	10.0	14.0	13.0	24.0	20.1	21.3	0.15
931214	0100	1.88	0.083	0.083	11.98	11.98	10.0	12.0	12.8	20.9	20.5	18.0	0.13
931214	0400	1.86	0.083	0.083	11.98	11.98	8.0	10.0	12.4	20.2	19.4	17.4	0.17
931214	0700	1.91	0.074	0.074	13.56	13.56	6.0	10.0	12.0	20.1	20.6	16.2	0.24
931214	1000	1.96	0.083	0.083	11.98	11.98	8.0	8.0	9.4	21.8	21.9	16.1	0.18
931214	1300	1.87	0.083	0.083	11.98	11.98	10.0	8.0	9.3	22.4	22.8	21.7	0.13
931214	1600	1.84	0.083	0.083	11.98	11.98	6.0	4.0	6.0	23.5	22.8	21.6	0.14
931214	1900	1.82	0.083	0.083	11.98	11.98	4.0	4.0	4.8	23.4	23.6	22.2	0.16
931214	2200	1.70	0.093	0.093	10.72	10.72	2.0	2.0	1.4	23.8	23.0	20.1	0.15
931215	0100	1.68	0.093	0.083	10.72	11.98	-2.0	0.0	7.1	24.2	23.6	21.1	0.12
931215	0400	1.85	0.103	0.083	9.71	11.98	2.0	4.0	14.6	29.1	26.0	22.2	0.12
931215	0700	1.83	0.093	0.093	10.72	10.72	0.0	12.0	23.9	33.2	26.3	18.7	0.15
931215	1000	2.05	0.152	0.142	6.59	7.04	26.0	8.0	23.0	31.7	27.1	22.7	0.15
931215	1300	1.82	0.142	0.142	7.04	7.04	8.0	10.0	18.3	33.9	31.0	26.8	0.13
931215	1600	1.33	0.123	0.132	8.16	7.56	-42.0	10.0	3.0	46.6	47.9	35.4	0.12
931215	1900	1.41	0.123	0.123	8.16	8.16	10.0	12.0	20.5	49.0	47.4	26.4	0.16
931215	2200	1.39	0.123	0.123	8.16	8.16	6.0	10.0	21.3	45.9	45.4	38.9	0.19
931216	0100	1.99	0.162	0.132	6.19	7.56	38.0	38.0	34.8	24.4	16.2	21.1	0.22
931216	0400	2.50	0.123	0.123	8.16	8.16	16.0	20.0	28.3	25.1	16.7	13.2	0.22
931216	0700	2.98	0.103	0.103	9.71	9.71	10.0	18.0	26.5	25.3	19.8	15.8	0.23
931216	1000	2.90	0.103	0.103	9.71	9.71	10.0	12.0	26.1	27.1	20.0	14.1	0.21
931216	1300	2.71	0.093	0.093	10.72	10.72	10.0	14.0	23.6	26.3	20.2	14.8	0.19
931216	1600	2.62	0.083	0.083	11.98	11.98	8.0	12.0	21.3	25.9	20.9	14.6	0.18
931216	1900	2.62	0.083	0.083	11.98	11.98	10.0	10.0	19.7	24.1	20.8	16.6	0.19
931216	2200	2.60	0.083	0.083	11.98	11.98	10.0	12.0	19.2	23.9	20.8	15.6	0.21
931217	0100	2.74	0.074	0.074	13.56	13.56	2.0	4.0	14.6	23.7	22.4	14.5	0.17
931217	0400	2.79	0.074	0.074	13.56	13.56	6.0	6.0	9.2	23.2	23.3	19.1	0.15
931217	0700	3.12	0.074	0.074	13.56	13.56	-4.0	8.0	2.3	22.3	23.0	21.8	0.18
931217	1000	3.55	0.074	0.064	13.56	15.63	10.0	2.0	2.9	21.0	21.3	21.6	0.20

(Sheet 12 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931217	1300	3.49	0.064	0.064	15.63	15.63	-10.0	0.0	-1.8	19.8	19.5	21.6	0.17
931217	1600	2.90	0.074	0.074	13.56	13.56	10.0	6.0	5.9	19.0	18.8	19.7	0.14
931217	1900	2.57	0.064	0.064	15.63	15.63	4.0	2.0	4.7	19.7	19.9	16.2	0.18
931217	2200	2.51	0.064	0.064	15.63	15.63	6.0	2.0	2.3	20.1	20.6	18.2	0.18
931218	0100	2.57	0.074	0.064	13.56	15.63	-4.0	-2.0	-0.7	18.6	19.0	20.5	0.20
931218	0400	2.38	0.074	0.074	13.56	13.56	6.0	4.0	3.3	18.9	18.9	18.5	0.18
931218	0700	2.28	0.074	0.074	13.56	13.56	2.0	2.0	2.6	22.4	22.5	21.1	0.18
931218	1000	2.30	0.074	0.074	13.56	13.56	0.0	0.0	-1.3	23.5	23.7	25.2	0.19
931218	1300	2.21	0.074	0.074	13.56	13.56	8.0	2.0	2.9	23.7	23.8	24.5	0.20
931218	1600	2.07	0.074	0.074	13.56	13.56	6.0	4.0	-1.5	22.0	21.7	21.1	0.18
931218	1900	1.88	0.064	0.074	15.63	13.56	-8.0	-8.0	1.1	23.6	23.5	26.0	0.19
931218	2200	1.74	0.074	0.074	13.56	13.56	6.0	-8.0	0.1	24.5	24.0	25.9	0.19
931219	0100	1.56	0.074	0.074	13.56	13.56	6.0	-4.0	0.8	23.1	22.5	23.9	0.23
931219	0400	1.36	0.074	0.074	13.56	13.56	4.0	2.0	1.2	23.3	23.1	23.2	0.26
931219	0700	1.24	0.083	0.074	11.98	13.56	6.0	6.0	3.9	24.3	24.7	24.8	0.23
931219	1000	1.13	0.074	0.074	13.56	13.56	2.0	-2.0	4.5	26.5	26.3	24.8	0.42
931219	1300	1.00	0.074	0.074	13.56	13.56	-10.0	-8.0	0.5	24.0	23.8	20.9	0.35
931219	1600	0.95	0.083	0.083	11.98	11.98	8.0	-6.0	2.3	25.3	25.0	22.5	0.21
931219	1900	0.90	0.083	0.083	11.98	11.98	-2.0	-2.0	-2.6	25.5	25.4	21.8	0.24
931219	2200	0.83	0.074	0.083	13.56	11.98	2.0	2.0	3.2	32.6	31.1	29.3	0.35
931220	0100	0.72	0.083	0.083	11.98	11.98	0.0	2.0	2.7	35.1	32.0	24.9	0.32
931220	0400	0.71	0.083	0.083	11.98	11.98	4.0	0.0	1.2	30.5	27.9	24.0	0.27
931220	0700	0.65	0.083	0.083	11.98	11.98	-4.0	-2.0	-4.0	33.4	28.7	24.1	0.23
931220	1000	0.62	0.083	0.083	11.98	11.98	-2.0	-16.0	-2.4	32.7	28.9	23.6	0.33
931220	1300	0.60	0.083	0.083	11.98	11.98	-14.0	-10.0	-7.2	31.8	30.9	24.2	0.24
931220	1600	0.57	0.083	0.083	11.98	11.98	-8.0	-10.0	-5.9	31.9	30.1	25.0	0.26
931220	1900	0.55	0.093	0.083	10.72	11.98	-6.0	-8.0	-3.9	34.4	32.4	24.3	0.27
931220	2200	0.61	0.083	0.083	11.98	11.98	-6.0	-6.0	-2.9	37.1	36.4	23.3	0.26
931221	0100	0.69	0.162	0.318	6.19	3.15	-44.0	-44.0	-31.8	38.1	32.0	24.5	0.21
931221	0400	1.13	0.162	0.142	6.19	7.04	-46.0	-44.0	-39.5	25.3	21.3	19.9	0.15
931221	0700	0.85	0.142	0.132	7.04	7.56	-40.0	-40.0	-31.8	30.1	24.4	23.4	0.16
931221	1000	0.86	0.103	0.103	9.71	9.71	-38.0	-38.0	-32.4	27.8	26.5	22.0	0.19
931221	1300	0.68	0.103	0.103	9.71	9.71	-36.0	-38.0	-23.0	36.1	31.7	30.3	0.27
931221	1600	0.65	0.123	0.103	8.16	9.71	-36.0	72.0	7.2	91.7	25.5	31.9	0.22
931221	1900	0.66	0.230	0.103	4.35	9.71	62.0	68.0	25.4	79.5	21.8	30.0	0.22
931221	2200	0.65	0.279	0.103	3.59	9.71	88.0	88.0	36.3	85.5	24.5	33.7	0.32
931222	0100	0.56	0.289	0.103	3.47	9.71	90.0	90.0	18.7	95.8	25.4	25.1	0.40
931222	0400	0.55	0.289	0.103	3.47	9.71	90.0	90.0	5.6	57.8	29.8	31.9	0.38
931222	0700	0.56	0.103	0.103	9.71	9.71	-22.0	-24.0	1.0	43.7	30.3	29.7	0.27
931222	1000	0.56	0.103	0.103	9.71	9.71	-34.0	-10.0	-3.3	41.0	31.9	29.8	0.33
931222	1300	0.57	0.103	0.103	9.71	9.71	-16.0	-8.0	-3.9	35.9	33.0	30.1	0.39
931222	1600	0.52	0.113	0.103	8.87	9.71	-34.0	-34.0	-4.1	36.8	31.4	24.2	0.37
931222	1900	0.53	0.113	0.103	8.87	9.71	-26.0	-10.0	-7.8	32.0	28.2	24.1	0.32
931222	2200	0.54	0.123	0.064	8.16	15.63	-34.0	-8.0	-12.2	32.2	26.9	22.2	0.31
931223	0100	0.54	0.064	0.064	15.63	15.63	-8.0	-10.0	-8.4	32.5	28.7	21.5	0.40
931223	0400	0.51	0.113	0.113	8.87	8.87	-24.0	-10.0	-10.1	34.1	28.0	19.3	0.35
931223	0700	0.62	0.064	0.064	15.63	15.63	-12.0	90.0	18.0	73.1	25.7	17.1	0.35
931223	1000	0.86	0.210	0.220	4.75	4.54	54.0	54.0	34.7	50.0	23.7	19.1	0.21
931223	1300	1.09	0.191	0.191	5.24	5.24	52.0	52.0	45.5	22.8	17.5	10.6	0.26
931223	1600	1.11	0.171	0.181	5.83	5.52	44.0	46.0	43.2	21.6	15.7	8.9	0.24
931223	1900	1.02	0.171	0.171	5.83	5.83	34.0	38.0	33.3	27.8	17.1	14.0	0.17
931223	2200	1.15	0.152	0.152	6.59	6.59	14.0	14.0	25.1	24.3	17.5	10.5	0.14
931224	0100	1.21	0.132	0.132	7.56	7.56	14.0	14.0	22.3	20.5	19.2	10.5	0.15
931224	0400	1.10	0.132	0.132	7.56	7.56	14.0	16.0	17.4	25.6	18.6	11.0	0.16
931224	0700	0.98	0.103	0.103	9.71	9.71	-2.0	10.0	15.8	27.5	20.0	15.5	0.15
931224	1000	1.05	0.103	0.103	9.71	9.71	6.0	10.0	9.9	25.4	21.1	17.1	0.12
931224	1300	1.07	0.103	0.103	9.71	9.71	4.0	6.0	11.7	25.7	23.7	19.3	0.16
931224	1600	0.98	0.093	0.093	10.72	10.72	10.0	2.0	11.9	26.2	23.7	22.1	0.25

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
931224	1900	0.97	0.093	0.093	10.72	10.72	-2.0	0.0	4.7	21.9	22.2	17.5	0.17
931224	2200	0.92	0.093	0.093	10.72	10.72	2.0	4.0	6.8	23.0	23.9	18.4	0.14
931225	0100	0.79	0.093	0.093	10.72	10.72	-10.0	-10.0	3.1	26.3	27.0	21.3	0.25
931225	0400	0.74	0.093	0.093	10.72	10.72	-8.0	-4.0	2.2	26.0	25.9	20.7	0.24
931225	0700	0.71	0.093	0.093	10.72	10.72	-14.0	-4.0	-6.5	24.2	24.0	22.0	0.29
931225	1000	0.62	0.093	0.093	10.72	10.72	-2.0	8.0	4.8	24.2	24.0	22.6	0.23
931225	1300	0.59	0.093	0.093	10.72	10.72	0.0	4.0	-2.9	25.1	26.0	22.0	0.38
931225	1600	0.56	0.093	0.093	10.72	10.72	8.0	6.0	5.3	25.0	26.5	22.7	0.33
931225	1900	0.51	0.093	0.093	10.72	10.72	6.0	6.0	3.8	24.0	25.1	19.5	0.37
931225	2200	0.44	0.093	0.093	10.72	10.72	10.0	8.0	-4.8	26.8	26.7	24.5	0.33
931226	0100	0.40	0.132	0.093	7.56	10.72	-40.0	-42.0	-18.3	45.7	25.8	25.1	0.26
931226	0400	0.43	0.123	0.093	8.16	10.72	-42.0	70.0	27.4	85.9	22.5	26.9	0.28
931226	0700	0.53	0.210	0.230	4.75	4.35	60.0	66.0	40.9	41.5	15.2	5.4	0.31
931226	1000	0.42	0.259	0.093	3.86	10.72	68.0	66.0	20.5	83.5	23.4	31.7	0.23
931226	1300	0.35	0.113	0.093	8.87	10.72	-36.0	-38.0	-0.7	71.6	32.9	27.6	0.27
931226	1600	0.31	0.132	0.132	7.56	7.56	-38.0	-38.0	-9.4	47.1	43.8	42.8	0.28
931226	1900	0.29	0.132	0.103	7.56	9.71	-38.0	-38.0	-35.2	42.2	34.8	36.5	0.27
931226	2200	0.29	0.123	0.123	8.16	8.16	-36.0	-38.0	-39.3	32.1	20.0	30.1	0.18
931227	0100	0.25	0.181	0.103	5.52	9.71	-44.0	-46.0	-38.2	30.0	18.7	25.5	0.27
931227	0400	0.25	0.142	0.132	7.04	7.56	-40.0	-40.0	-39.2	29.0	20.4	8.3	0.30
931227	0700	0.28	0.132	0.132	7.56	7.56	-40.0	-40.0	-40.0	28.0	20.7	7.2	0.27
931227	1000	0.26	0.132	0.132	7.56	7.56	-38.0	-38.0	-35.7	36.7	33.4	19.8	0.22
931227	1300	0.30	0.132	0.132	7.56	7.56	-38.0	-38.0	-21.6	47.9	46.2	20.7	0.20
931227	1600	0.44	0.181	0.181	5.52	5.52	36.0	36.0	13.3	63.7	43.4	10.0	0.21
931227	1900	0.59	0.181	0.171	5.52	5.83	36.0	36.0	28.4	30.4	31.6	22.6	0.19
931227	2200	0.69	0.162	0.162	6.19	6.19	32.0	32.0	43.3	36.1	22.7	17.8	0.14
931228	0100	0.74	0.152	0.152	6.59	6.59	16.0	16.0	38.2	35.2	21.0	13.2	0.15
931228	0400	0.80	0.152	0.152	6.59	6.59	20.0	20.0	38.0	32.0	26.3	14.4	0.18
931228	0700	0.79	0.162	0.181	6.19	5.52	24.0	28.0	36.9	30.6	23.5	21.8	0.18
931228	1000	0.79	0.181	0.181	5.52	5.52	40.0	52.0	39.8	32.7	20.9	16.1	0.19
931228	1300	0.96	0.181	0.181	5.52	5.52	46.0	46.0	39.5	27.2	20.5	18.4	0.20
931228	1600	1.26	0.171	0.171	5.83	5.83	42.0	40.0	39.0	19.1	17.8	12.1	0.20
931228	1900	1.53	0.152	0.152	6.59	6.59	26.0	38.0	32.0	16.1	15.7	11.3	0.18
931228	2200	1.84	0.152	0.152	6.59	6.59	28.0	26.0	31.9	19.2	17.5	10.2	0.18
931229	0100	1.78	0.142	0.142	7.04	7.04	20.0	22.0	26.4	21.2	18.3	12.9	0.15
931229	0400	1.52	0.132	0.142	7.56	7.04	14.0	16.0	26.7	23.7	21.0	16.5	0.16
931229	0700	1.35	0.142	0.142	7.04	7.04	20.0	22.0	25.8	22.3	18.9	15.7	0.17
931229	1000	1.24	0.142	0.142	7.04	7.04	16.0	18.0	22.4	21.3	16.0	11.8	0.13
931229	1300	1.08	0.132	0.123	7.56	8.16	10.0	12.0	20.8	24.2	18.3	18.8	0.11
931229	1600	1.08	0.123	0.123	8.16	8.16	8.0	10.0	19.1	24.7	18.8	13.3	0.14
931229	1900	0.93	0.123	0.113	8.16	8.87	8.0	10.0	15.4	24.7	18.6	14.1	0.18
931229	2200	0.74	0.113	0.113	8.87	8.87	2.0	2.0	18.2	28.6	17.0	12.5	0.20
931230	0100	0.58	0.113	0.113	8.87	8.87	2.0	26.0	17.0	28.4	14.5	13.1	0.15
931230	0400	0.59	0.152	0.152	6.59	6.59	22.0	40.0	26.7	27.7	12.6	12.3	0.18
931230	0700	0.58	0.191	0.162	5.24	6.19	40.0	40.0	34.8	21.1	12.2	13.2	0.19
931230	1000	0.76	0.171	0.171	5.83	5.83	38.0	46.0	38.9	17.8	10.3	8.9	0.24
931230	1300	1.01	0.171	0.162	5.83	6.19	40.0	42.0	39.1	20.1	11.2	10.2	0.19
931230	1600	1.20	0.152	0.152	6.59	6.59	28.0	36.0	36.2	20.3	13.8	12.4	0.16
931230	1900	1.08	0.162	0.162	6.19	6.19	34.0	34.0	33.4	18.4	13.8	10.9	0.17
931230	2200	0.95	0.142	0.152	7.04	6.59	22.0	24.0	31.2	17.8	13.8	11.2	0.14
931231	0100	0.76	0.152	0.152	6.59	6.59	24.0	30.0	29.3	20.4	14.5	8.8	0.11
931231	0400	0.73	0.171	0.171	5.83	5.83	30.0	28.0	28.7	22.8	17.2	8.1	0.14
931231	0700	0.64	0.123	0.171	8.16	5.83	14.0	14.0	26.1	25.6	19.0	15.0	0.18
931231	1000	0.59	0.132	0.132	7.56	7.56	14.0	14.0	19.8	21.7	17.1	6.9	0.20
931231	1300	0.48	0.142	0.142	7.04	7.04	14.0	14.0	14.1	29.2	21.8	12.2	0.15
931231	1600	0.42	0.152	0.152	6.59	6.59	16.0	14.0	7.8	32.2	26.6	12.7	0.20
931231	1900	0.41	0.171	0.113	5.83	8.87	16.0	16.0	3.7	34.0	29.5	27.6	0.28
931231	2200	0.42	0.113	0.093	8.87	10.72	-14.0	-12.0	-5.3	28.2	27.4	30.6	0.31

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940101	0100	0.44	0.093	0.093	10.72	10.72	2.0	-10.0	-3.4	23.4	24.0	23.3	0.34
940101	0400	0.46	0.093	0.093	10.72	10.72	-6.0	-10.0	-8.8	22.4	23.0	22.4	0.33
940101	0700	0.47	0.103	0.103	9.71	9.71	-4.0	-6.0	-6.7	23.3	23.6	21.4	0.41
940101	1000	0.44	0.103	0.103	9.71	9.71	-6.0	-6.0	-9.0	23.9	24.0	21.0	0.35
940101	1300	0.43	0.103	0.103	9.71	9.71	-14.0	-10.0	-11.1	25.7	26.0	27.2	0.37
940101	1600	0.41	0.064	0.103	15.63	9.71	-10.0	-10.0	-15.3	26.0	25.7	26.8	0.31
940101	1900	0.41	0.103	0.103	9.71	9.71	-22.0	-20.0	-18.3	29.4	25.7	28.7	0.35
940101	2200	0.47	0.103	0.103	9.71	9.71	-16.0	-30.0	-31.1	28.5	22.6	22.2	0.25
940102	0100	0.74	0.152	0.142	6.59	7.04	-46.0	-42.0	-39.3	24.3	19.3	16.0	0.17
940102	0400	0.74	0.142	0.142	7.04	7.04	-42.0	-40.0	-38.4	25.8	24.1	20.9	0.15
940102	0700	0.80	0.132	0.132	7.56	7.56	-42.0	-42.0	-34.1	26.0	22.9	23.1	0.18
940102	1000	0.87	0.113	0.113	8.87	8.87	-30.0	-42.0	-16.2	33.7	24.2	17.5	0.22
940102	1300	0.77	0.123	0.113	8.16	8.87	-42.0	-16.0	2.1	76.8	26.3	20.0	0.20
940102	1600	0.82	0.123	0.123	8.16	8.16	-38.0	-16.0	11.2	57.6	25.3	22.5	0.22
940102	1900	1.11	0.162	0.162	6.19	6.19	20.0	18.0	15.5	35.8	24.2	14.1	0.14
940102	2200	1.13	0.162	0.152	6.19	6.59	18.0	18.0	8.0	36.5	25.3	21.8	0.11
940103	0100	1.06	0.162	0.113	6.19	8.87	22.0	22.0	9.1	38.0	24.6	22.3	0.11
940103	0400	1.15	0.123	0.230	8.16	4.35	-38.0	22.0	11.5	41.6	24.9	15.7	0.10
940103	0700	1.32	0.142	0.201	7.04	4.98	-40.0	38.0	15.2	49.4	25.9	24.3	0.11
940103	1000	1.28	0.201	0.201	4.98	4.98	42.0	42.0	11.3	53.4	33.8	37.9	0.12
940103	1300	1.57	0.171	0.162	5.83	6.19	0.0	0.0	18.0	47.5	27.0	18.8	0.13
940103	1600	2.33	0.171	0.132	5.83	7.56	42.0	42.0	25.2	40.0	23.2	22.4	0.17
940103	1900	2.88	0.132	0.132	7.56	7.56	10.0	10.0	18.3	28.0	23.2	18.3	0.15
940103	2200	3.04	0.103	0.103	9.71	9.71	10.0	6.0	18.5	24.1	24.1	13.5	0.16
940104	0100	2.33	0.103	0.113	9.71	8.87	8.0	16.0	19.0	27.7	27.1	25.2	0.16
940104	0400	1.74	0.103	0.103	9.71	9.71	14.0	12.0	16.0	27.3	29.4	17.0	0.15
940104	0700	1.50	0.103	0.103	9.71	9.71	12.0	12.0	-15.4	52.3	45.0	32.5	0.18
940104	1000	1.23	0.123	0.093	8.16	10.72	-44.0	-44.0	-22.8	54.3	34.4	31.1	0.22
940104	1300	0.91	0.093	0.093	10.72	10.72	12.0	-44.0	-18.9	51.3	32.0	40.8	0.25
940104	1600	0.72	0.093	0.093	10.72	10.72	16.0	-42.0	-28.3	45.1	30.2	38.0	0.24
940104	1900	0.69	0.113	0.093	8.87	10.72	-38.0	-40.0	-32.3	39.1	28.3	36.0	0.22
940104	2200	0.66	0.093	0.093	10.72	10.72	0.0	-40.0	-22.8	42.0	36.3	38.9	0.27
940105	0100	0.61	0.093	0.093	10.72	10.72	-2.0	-40.0	-11.6	45.3	37.7	32.2	0.30
940105	0400	0.68	0.220	0.103	4.54	9.71	52.0	52.0	19.5	62.5	25.8	36.7	0.17
940105	0700	0.66	0.201	0.103	4.98	9.71	50.0	50.0	16.8	60.6	28.0	43.1	0.17
940105	1000	0.69	0.181	0.181	5.52	5.52	42.0	42.0	25.4	47.1	25.6	10.9	0.18
940105	1300	0.55	0.171	0.093	5.83	10.72	36.0	36.0	19.1	51.4	27.4	35.8	0.25
940105	1600	0.48	0.162	0.093	6.19	10.72	28.0	12.0	21.8	44.4	26.3	33.4	0.26
940105	1900	0.48	0.181	0.093	5.52	10.72	26.0	10.0	16.8	42.2	25.3	24.7	0.21
940105	2200	0.45	0.142	0.113	7.04	8.87	10.0	10.0	15.4	39.1	25.7	36.8	0.27
940106	0100	0.43	0.132	0.103	7.56	9.71	10.0	10.0	7.5	42.2	30.6	33.8	0.25
940106	0400	0.43	0.113	0.103	8.87	9.71	-36.0	10.0	1.3	37.2	29.8	24.9	0.27
940106	0700	0.42	0.113	0.113	8.87	8.87	-18.0	-8.0	2.2	34.5	31.9	24.6	0.23
940106	1000	0.46	0.113	0.103	8.87	9.71	-6.0	-10.0	0.5	35.5	31.4	25.4	0.28
940106	1300	0.48	0.113	0.103	8.87	9.71	-34.0	-10.0	1.5	39.4	29.4	25.5	0.21
940106	1600	0.47	0.103	0.103	9.71	9.71	-20.0	-10.0	5.1	38.9	29.6	21.5	0.23
940106	1900	0.47	0.113	0.113	8.87	8.87	-18.0	-14.0	-28.8	41.3	43.4	22.9	0.18
940106	2200	0.49	0.113	0.113	8.87	8.87	-34.0	-38.0	-34.6	35.6	29.1	19.7	0.20
940107	0100	0.44	0.152	0.103	6.59	9.71	-42.0	-40.0	-35.7	30.4	20.7	21.5	0.24
940107	0400	0.43	0.152	0.103	6.59	9.71	-40.0	-40.0	-33.6	28.2	19.2	22.1	0.24
940107	0700	0.41	0.103	0.103	9.71	9.71	-28.0	-38.0	-35.2	24.9	17.1	16.7	0.22
940107	1000	0.43	0.142	0.113	7.04	8.87	-40.0	-38.0	-34.0	22.0	17.1	16.6	0.25
940107	1300	0.45	0.142	0.113	7.04	8.87	-40.0	-40.0	-38.1	22.9	17.1	17.0	0.26
940107	1600	0.49	0.103	0.103	9.71	9.71	-32.0	-40.0	-42.1	22.6	15.3	14.6	0.22
940107	1900	0.50	0.132	0.103	7.56	9.71	-38.0	-40.0	-43.2	26.2	14.5	16.7	0.19
940107	2200	0.56	0.113	0.113	8.87	8.87	-28.0	-40.0	-38.0	23.6	15.3	13.7	0.21
940108	0100	0.57	0.113	0.113	8.87	8.87	-30.0	-42.0	-43.7	23.8	13.8	11.6	0.25
940108	0400	0.54	0.132	0.113	7.56	8.87	-42.0	-42.0	-42.5	20.2	14.4	13.6	0.24

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940108	0700	0.51	0.132	0.113	7.56	8.87	-42.0	-40.0	-38.9	19.7	17.5	15.1	0.26
940108	1000	0.54	0.132	0.113	7.56	8.87	-42.0	-42.0	-12.2	69.8	20.7	15.1	0.24
940108	1300	0.82	0.220	0.240	4.54	4.17	42.0	42.0	20.8	69.3	29.7	13.9	0.15
940108	1600	0.72	0.123	0.113	8.16	8.87	-40.0	44.0	17.8	72.5	27.0	15.0	0.18
940108	1900	0.67	0.308	0.113	3.25	8.87	56.0	44.0	19.8	53.6	23.8	23.0	0.22
940108	2200	1.14	0.201	0.201	4.98	4.98	36.0	38.0	36.5	20.2	16.3	8.3	0.21
940109	0100	1.47	0.162	0.171	6.19	5.83	24.0	26.0	35.9	24.7	19.1	14.5	0.23
940109	0400	1.67	0.152	0.152	6.59	6.59	24.0	22.0	35.1	25.0	17.3	12.1	0.23
940109	0700	1.52	0.142	0.142	7.04	7.04	22.0	24.0	34.0	23.9	17.1	10.8	0.21
940109	1000	1.27	0.152	0.152	6.59	6.59	24.0	24.0	33.9	23.3	17.7	11.1	0.16
940109	1300	1.10	0.152	0.162	6.59	6.19	24.0	26.0	33.0	23.2	18.4	14.0	0.17
940109	1600	0.92	0.162	0.162	6.19	6.19	26.0	28.0	31.3	21.9	18.2	9.8	0.17
940109	1900	0.82	0.171	0.171	5.83	5.83	28.0	30.0	28.6	23.5	18.0	11.4	0.17
940109	2200	0.87	0.171	0.171	5.83	5.83	26.0	28.0	31.8	25.2	17.3	7.3	0.17
940110	0100	1.25	0.191	0.191	5.24	5.24	36.0	32.0	37.6	25.2	18.6	12.3	0.18
940110	0400	1.76	0.162	0.152	6.19	6.59	28.0	28.0	35.9	24.2	19.8	15.1	0.20
940110	0700	1.73	0.142	0.142	7.04	7.04	24.0	24.0	35.8	21.8	19.1	9.3	0.18
940110	1000	1.43	0.142	0.152	7.04	6.59	22.0	24.0	32.7	22.8	19.3	13.1	0.16
940110	1300	1.17	0.152	0.152	6.59	6.59	24.0	26.0	28.4	26.0	21.7	12.7	0.14
940110	1600	0.99	0.162	0.162	6.19	6.19	24.0	30.0	28.5	29.3	23.9	12.5	0.15
940110	1900	0.89	0.123	0.123	8.16	8.16	6.0	28.0	22.2	29.5	24.7	12.7	0.16
940110	2200	0.84	0.123	0.113	8.16	8.87	10.0	12.0	16.9	31.9	28.1	24.7	0.13
940111	0100	0.86	0.142	0.142	7.04	7.04	14.0	8.0	14.0	32.8	30.3	18.1	0.11
940111	0400	0.79	0.152	0.152	6.59	6.59	10.0	8.0	8.8	31.1	31.3	16.6	0.15
940111	0700	0.71	0.142	0.162	7.04	6.19	12.0	12.0	11.8	36.0	33.1	24.0	0.17
940111	1000	0.66	0.132	0.132	7.56	7.56	12.0	10.0	9.4	36.7	37.0	19.8	0.17
940111	1300	0.73	0.142	0.142	7.04	7.04	10.0	-8.0	6.5	38.6	36.7	20.8	0.15
940111	1600	0.72	0.113	0.113	8.87	8.87	-6.0	-8.0	2.7	39.9	37.9	21.1	0.18
940111	1900	0.68	0.123	0.103	8.16	9.71	0.0	-6.0	-1.1	39.6	39.6	27.2	0.19
940111	2200	0.61	0.103	0.103	9.71	9.71	-4.0	-4.0	-7.2	34.7	36.9	22.8	0.26
940112	0100	0.62	0.064	0.103	15.63	9.71	-12.0	-12.0	-17.4	32.7	31.8	26.0	0.23
940112	0400	0.66	0.064	0.103	15.63	9.71	-10.0	-12.0	-23.6	35.3	31.8	26.6	0.22
940112	0700	0.69	0.064	0.103	15.63	9.71	-12.0	-12.0	-35.6	38.3	32.3	25.8	0.21
940112	1000	0.69	0.162	0.103	6.19	9.71	-46.0	-16.0	-39.1	37.0	31.6	26.0	0.24
940112	1300	0.91	0.142	0.152	7.04	6.59	-44.0	-44.0	-42.1	26.9	25.4	19.2	0.17
940112	1600	1.23	0.123	0.123	8.16	8.16	-46.0	-44.0	-35.6	28.9	27.5	25.6	0.17
940112	1900	1.15	0.113	0.103	8.87	9.71	-28.0	-28.0	-16.2	56.6	26.2	17.6	0.21
940112	2200	1.08	0.103	0.103	9.71	9.71	-30.0	-40.0	-15.3	47.0	21.7	17.5	0.15
940113	0100	1.06	0.103	0.103	9.71	9.71	-26.0	-26.0	-13.0	38.7	22.0	16.5	0.13
940113	0400	0.98	0.113	0.113	8.87	8.87	-44.0	-42.0	-13.2	58.3	22.6	20.3	0.15
940113	0700	0.94	0.113	0.113	8.87	8.87	-30.0	-28.0	-4.1	65.4	23.5	20.9	0.19
940113	1000	0.99	0.113	0.113	8.87	8.87	-20.0	-20.0	-2.6	57.6	23.1	22.5	0.18
940113	1300	0.95	0.113	0.113	8.87	8.87	-16.0	-18.0	0.2	52.3	21.3	21.3	0.16
940113	1600	0.92	0.113	0.113	8.87	8.87	-26.0	-24.0	-3.1	52.4	25.6	17.2	0.16
940113	1900	0.91	0.123	0.123	8.16	8.16	-40.0	28.0	-0.9	53.1	29.0	20.8	0.22
940113	2200	0.85	0.113	0.113	8.87	8.87	-20.0	10.0	9.9	48.0	29.0	22.7	0.21
940114	0100	0.85	0.113	0.123	8.87	8.16	-26.0	6.0	8.0	42.6	26.8	26.4	0.19
940114	0400	0.95	0.123	0.123	8.16	8.16	-32.0	48.0	17.6	47.6	25.3	15.9	0.21
940114	0700	0.96	0.250	0.230	4.01	4.35	46.0	44.0	18.0	42.5	25.1	23.1	0.23
940114	1000	0.80	0.210	0.123	4.75	8.16	28.0	12.0	13.4	41.4	24.8	23.6	0.24
940114	1300	0.67	0.113	0.054	8.87	18.45	-36.0	8.0	3.0	36.7	26.0	30.0	0.27
940114	1600	0.61	0.054	0.054	18.45	18.45	8.0	6.0	0.4	31.7	27.1	27.3	0.36
940114	1900	0.57	0.054	0.054	18.45	18.45	2.0	-10.0	-5.5	30.4	27.3	26.4	0.43
940114	2200	0.65	0.054	0.054	18.45	18.45	0.0	56.0	17.7	54.7	22.5	20.7	9.99
940115	0100	1.44	0.171	0.171	5.83	5.83	36.0	42.0	36.7	16.7	12.8	8.0	0.24
940115	0400	1.19	0.162	0.152	6.19	6.59	36.0	36.0	30.1	20.5	16.3	10.5	0.21
940115	0700	1.19	0.142	0.162	7.04	6.19	26.0	32.0	27.7	24.4	18.0	11.5	0.17
940115	1000	1.03	0.142	0.142	7.04	7.04	22.0	26.0	25.7	25.6	18.2	15.0	0.19

(Sheet 16 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940115	1300	0.78	0.152	0.054	6.59	18.45	26.0	26.0	24.1	34.9	16.7	20.4	0.20
940115	1600	0.78	0.162	0.054	6.19	18.45	28.0	48.0	29.0	37.3	14.2	24.2	0.23
940115	1900	0.85	0.191	0.054	5.24	18.45	40.0	56.0	38.6	28.4	13.3	20.2	0.28
940115	2200	0.95	0.240	0.298	4.17	3.35	52.0	52.0	44.1	19.3	11.4	11.1	0.41
940116	0100	1.17	0.162	0.162	6.19	6.19	40.0	40.0	39.4	17.8	11.7	8.6	0.23
940116	0400	1.18	0.162	0.162	6.19	6.19	34.0	36.0	37.9	19.8	12.1	8.0	0.21
940116	0700	1.28	0.162	0.162	6.19	6.19	44.0	44.0	40.7	22.2	13.6	9.8	0.23
940116	1000	1.20	0.162	0.152	6.19	6.59	42.0	42.0	37.8	22.3	14.8	11.2	0.22
940116	1300	1.03	0.152	0.152	6.59	6.59	28.0	30.0	35.2	21.9	15.4	10.0	0.20
940116	1600	0.83	0.142	0.162	7.04	6.19	22.0	30.0	32.6	26.2	18.5	12.2	0.16
940116	1900	0.72	0.181	0.181	5.52	5.52	38.0	38.0	32.0	32.5	22.2	14.8	0.16
940116	2200	0.66	0.191	0.191	5.24	5.24	34.0	12.0	26.3	37.3	25.4	24.1	0.17
940117	0100	0.60	0.142	0.142	7.04	7.04	10.0	12.0	23.9	36.2	28.1	16.0	0.18
940117	0400	0.55	0.123	0.123	8.16	8.16	8.0	10.0	14.4	35.5	28.0	22.7	0.17
940117	0700	0.64	0.308	0.308	3.25	3.25	-36.0	-14.0	-4.4	40.0	34.5	35.0	0.16
940117	1000	0.53	0.152	0.152	6.59	6.59	14.0	-10.0	1.2	32.4	30.6	31.2	0.18
940117	1300	0.85	0.162	0.162	6.19	6.19	-44.0	-44.0	-39.7	26.5	23.2	16.6	0.12
940117	1600	0.96	0.142	0.142	7.04	7.04	-38.0	-38.0	-41.3	23.8	20.0	18.8	0.17
940117	1900	1.20	0.132	0.123	7.56	8.16	-40.0	-52.0	-44.1	24.8	15.6	19.3	0.29
940117	2200	1.13	0.123	0.123	8.16	8.16	-40.0	-40.0	-41.7	23.9	19.3	20.3	0.20
940118	0100	1.11	0.132	0.113	7.56	8.87	-40.0	-40.0	-36.6	25.8	23.1	24.4	0.16
940118	0400	1.14	0.103	0.103	9.71	9.71	-32.0	-40.0	-4.1	75.3	22.6	22.6	0.17
940118	0700	1.13	0.103	0.103	9.71	9.71	-36.0	-36.0	4.4	71.1	23.5	19.5	0.15
940118	1900	1.40	0.181	0.162	5.52	6.19	32.0	34.0	26.7	33.4	17.1	14.3	0.22
940118	2200	1.40	0.162	0.171	6.19	5.83	28.0	52.0	30.4	26.1	14.5	11.4	0.27
940119	0100	1.60	0.162	0.162	6.19	6.19	34.0	38.0	34.0	23.7	15.0	9.5	0.24
940119	0400	1.53	0.152	0.152	6.59	6.59	34.0	34.0	33.1	23.4	15.1	9.4	0.24
940119	0700	1.76	0.142	0.152	7.04	6.59	26.0	28.0	34.4	20.6	14.3	11.2	0.21
940119	1000	1.74	0.152	0.152	6.59	6.59	32.0	32.0	36.4	22.3	14.3	9.6	0.23
940119	1300	1.49	0.142	0.162	7.04	6.19	22.0	24.0	33.3	24.2	15.7	11.2	0.23
940119	1600	1.14	0.152	0.152	6.59	6.59	24.0	32.0	30.0	26.5	18.0	11.4	0.17
940119	1900	0.93	0.162	0.162	6.19	6.19	30.0	32.0	25.3	35.4	21.1	12.3	0.13
940119	2200	0.83	0.152	0.113	6.59	8.87	18.0	14.0	21.4	37.4	23.6	28.1	0.14
940120	0100	0.74	0.142	0.142	7.04	7.04	24.0	10.0	17.6	37.9	24.6	18.7	0.18
940120	0400	0.65	0.162	0.093	6.19	10.72	10.0	10.0	11.4	36.2	23.7	23.7	0.21
940120	0700	0.69	0.318	0.103	3.15	9.71	64.0	12.0	19.7	45.2	25.5	25.3	0.23
940120	1000	0.68	0.103	0.093	9.71	10.72	-20.0	12.0	11.3	39.7	24.6	25.7	0.16
940120	1300	0.76	0.103	0.103	9.71	9.71	-34.0	8.0	18.3	47.9	26.9	27.9	0.20
940120	1600	0.78	0.259	0.093	3.86	10.72	54.0	10.0	18.3	47.2	25.9	29.1	0.18
940120	1900	0.90	0.230	0.103	4.35	9.71	26.0	24.0	21.6	44.0	23.0	26.2	0.17
940120	2200	0.95	0.210	0.220	4.75	4.54	20.0	22.0	21.2	40.3	23.7	23.3	0.19
940121	0100	1.09	0.201	0.220	4.98	4.54	22.0	54.0	27.0	38.8	20.7	19.5	0.22
940121	0400	1.21	0.191	0.191	5.24	5.24	34.0	40.0	31.6	29.2	17.0	13.5	0.24
940121	0700	1.23	0.171	0.181	5.83	5.52	24.0	34.0	29.9	29.3	18.3	17.9	0.19
940121	1000	1.28	0.171	0.171	5.83	5.83	26.0	26.0	27.7	29.6	16.4	9.8	0.20
940121	1300	1.15	0.171	0.171	5.83	5.83	26.0	28.0	25.0	32.1	17.4	10.6	0.21
940121	1600	1.01	0.171	0.171	5.83	5.83	26.0	26.0	19.8	33.8	19.5	15.5	0.16
940121	1900	0.91	0.171	0.093	5.83	10.72	20.0	18.0	11.3	34.1	20.2	24.7	0.14
940121	2200	0.84	0.171	0.093	5.83	10.72	24.0	24.0	10.4	37.2	22.9	30.3	0.16
940122	0100	0.74	0.093	0.093	10.72	10.72	-8.0	-8.0	4.6	33.7	21.4	22.6	0.18
940122	0400	0.60	0.093	0.093	10.72	10.72	-10.0	-6.0	1.5	28.4	23.5	25.7	0.24
940122	0700	0.50	0.093	0.093	10.72	10.72	-10.0	-8.0	-7.5	28.3	25.8	26.8	0.26
940122	1000	0.44	0.103	0.103	9.71	9.71	-4.0	-10.0	-8.5	26.8	26.1	27.3	0.27
940122	1300	0.40	0.093	0.093	10.72	10.72	-10.0	-8.0	-8.9	28.6	29.2	29.4	0.27
940122	1600	0.37	0.093	0.103	10.72	9.71	-22.0	-20.0	-13.4	31.4	32.3	29.0	0.25
940122	1900	0.36	0.093	0.093	10.72	10.72	-10.0	-12.0	-14.9	29.1	31.0	25.3	0.29
940122	2200	0.35	0.093	0.103	10.72	9.71	-26.0	-16.0	-23.9	33.8	29.0	29.1	0.26

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940123	0100	0.37	0.181	0.103	5.52	9.71	-46.0	-46.0	-34.5	36.9	24.4	30.3	0.22
940123	0400	0.36	0.103	0.103	9.71	9.71	-6.0	-36.0	-21.9	41.5	29.6	23.9	0.25
940123	0700	0.40	0.142	0.093	7.04	10.72	12.0	10.0	-5.2	41.1	29.3	24.1	0.21
940123	1000	0.43	0.103	0.103	9.71	9.71	-6.0	10.0	13.2	42.5	27.9	27.8	0.18
940123	1300	0.49	0.103	0.103	9.71	9.71	-34.0	10.0	11.3	47.4	31.8	25.8	0.20
940123	1600	0.45	0.113	0.113	8.87	8.87	-4.0	26.0	12.3	48.4	34.6	26.8	0.20
940123	1900	0.40	0.103	0.093	9.71	10.72	-34.0	-32.0	1.6	45.7	34.5	29.0	0.23
940123	2200	0.32	0.103	0.093	9.71	10.72	-32.0	-30.0	-7.9	38.3	39.4	28.2	0.25
940124	0100	0.26	0.103	0.103	9.71	9.71	-32.0	-32.0	-23.3	34.0	35.5	21.6	0.33
940124	0400	0.23	0.103	0.103	9.71	9.71	-32.0	-34.0	-27.9	31.2	33.8	22.7	0.32
940124	0700	0.24	0.103	0.093	9.71	10.72	-34.0	-32.0	-31.1	30.1	26.9	29.1	0.30
940124	1300	0.27	0.093	0.093	10.72	10.72	-30.0	-30.0	-31.5	26.9	25.9	20.8	0.32
940124	1600	0.29	0.083	0.083	11.98	11.98	-26.0	-32.0	-31.7	27.1	26.4	23.4	0.35
940124	1900	0.30	0.083	0.083	11.98	11.98	-24.0	-30.0	-29.9	27.2	27.7	26.7	0.34
940124	2200	0.32	0.093	0.083	10.72	11.98	-24.0	-26.0	-27.7	25.5	26.0	18.7	0.32
940125	0100	0.34	0.093	0.093	10.72	10.72	-32.0	-32.0	-30.5	24.4	26.4	21.8	0.32
940125	0400	0.34	0.093	0.083	10.72	11.98	-32.0	-32.0	-34.2	29.4	33.0	24.5	0.34
940125	0700	0.35	0.083	0.083	11.98	11.98	-32.0	-32.0	-31.7	27.8	30.8	21.5	0.35
940125	1000	0.34	0.093	0.093	10.72	10.72	-36.0	-30.0	-28.5	27.4	29.3	23.0	0.29
940125	1300	0.36	0.093	0.093	10.72	10.72	-30.0	-32.0	-27.6	27.9	29.2	25.0	0.28
940125	1600	0.40	0.318	0.093	3.15	10.72	56.0	56.0	-5.1	57.5	22.9	20.5	0.34
940125	1900	0.40	0.093	0.093	10.72	10.72	-36.0	-36.0	-4.5	68.1	23.6	23.5	0.34
940125	2200	0.56	0.201	0.093	4.98	10.72	38.0	38.0	17.3	53.5	15.8	23.5	0.23
940126	0100	0.57	0.191	0.093	5.24	10.72	36.0	40.0	12.6	54.2	18.8	21.3	0.22
940126	0400	0.55	0.181	0.093	5.52	10.72	24.0	24.0	7.4	52.3	19.9	20.6	0.27
940126	1000	0.44	0.093	0.093	10.72	10.72	-28.0	-28.0	-6.4	51.3	23.1	22.2	0.33
940126	1300	0.60	0.308	0.093	3.25	10.72	44.0	44.0	15.8	51.6	17.6	23.2	0.30
940126	1600	1.50	0.220	0.181	4.54	5.52	44.0	40.0	33.9	18.7	15.5	13.2	0.23
940126	1900	1.82	0.142	0.123	7.04	8.16	22.0	24.0	28.8	21.4	18.8	19.9	0.17
940126	2200	2.12	0.103	0.103	9.71	9.71	12.0	14.0	23.8	24.7	21.6	16.3	0.15
940127	0100	2.32	0.093	0.093	10.72	10.72	4.0	12.0	12.2	20.5	20.7	15.0	0.12
940127	0400	2.68	0.093	0.093	10.72	10.72	12.0	12.0	11.7	20.8	21.7	16.2	0.14
940127	0700	2.77	0.093	0.093	10.72	10.72	6.0	12.0	14.8	23.7	24.0	17.4	0.16
940127	1000	2.62	0.083	0.083	11.98	11.98	8.0	10.0	8.4	23.0	23.7	20.2	0.13
940127	1300	2.43	0.083	0.083	11.98	11.98	0.0	4.0	6.1	22.9	24.3	17.5	0.12
940127	1600	2.29	0.083	0.083	11.98	11.98	8.0	6.0	8.0	24.6	26.5	17.7	0.12
940127	1900	2.15	0.083	0.083	11.98	11.98	2.0	2.0	6.5	28.5	31.5	15.2	0.13
940127	2200	1.99	0.083	0.083	11.98	11.98	2.0	6.0	7.6	31.7	34.2	16.4	0.12
940128	0100	2.05	0.093	0.123	10.72	8.16	4.0	0.0	-3.7	30.6	32.6	27.2	0.14
940128	0400	2.04	0.093	0.123	10.72	8.16	0.0	0.0	-11.2	35.5	35.0	29.4	0.15
940128	0700	2.14	0.123	0.113	8.16	8.87	-14.0	-10.0	-28.0	38.0	33.4	33.5	0.21
940128	1000	2.28	0.113	0.113	8.87	8.87	-30.0	-16.0	-31.2	35.8	26.4	24.9	0.25
940128	1300	2.27	0.103	0.103	9.71	9.71	-26.0	-20.0	-28.8	28.1	24.9	24.9	0.19
940128	1600	2.00	0.103	0.103	9.71	9.71	-22.0	-22.0	-24.9	27.8	25.4	26.4	0.14
940128	1900	1.72	0.103	0.103	9.71	9.71	-12.0	-18.0	-24.0	29.3	27.1	26.8	0.15
940128	2200	1.35	0.103	0.103	9.71	9.71	-8.0	-12.0	-21.6	31.2	27.7	28.1	0.16
940129	0100	1.25	0.103	0.103	9.71	9.71	-12.0	-12.0	-19.3	27.0	24.9	23.1	0.11
940129	0400	1.20	0.113	0.113	8.87	8.87	-10.0	-12.0	-19.4	29.0	25.4	23.4	0.14
940129	0700	1.14	0.113	0.113	8.87	8.87	-26.0	-38.0	-26.6	28.2	23.8	25.2	0.19
940129	1000	0.94	0.113	0.113	8.87	8.87	-22.0	-22.0	-27.2	29.9	23.4	22.0	0.20
940129	1300	0.86	0.103	0.103	9.71	9.71	-8.0	-8.0	-19.1	28.7	26.1	23.6	0.12
940129	1600	0.87	0.113	0.113	8.87	8.87	-10.0	-10.0	-8.4	30.1	28.8	25.0	0.17
940129	1900	0.92	0.113	0.113	8.87	8.87	-22.0	-20.0	-10.5	38.6	24.5	20.6	0.16
940129	2200	0.85	0.123	0.113	8.16	8.87	-38.0	8.0	-9.1	39.4	26.2	26.3	0.16
940130	0100	0.90	0.113	0.113	8.87	8.87	-24.0	6.0	-5.5	39.1	25.7	21.1	0.12
940130	0400	1.43	0.191	0.201	5.24	4.98	26.0	6.0	9.0	32.8	24.9	19.2	0.11
940130	0700	1.78	0.162	0.162	6.19	6.19	16.0	14.0	20.5	34.2	28.1	17.4	0.15
940130	1000	1.85	0.152	0.152	6.59	6.59	24.0	28.0	23.3	35.6	26.5	21.5	0.15

(Sheet 18 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940130	1300	1.82	0.152	0.152	6.59	6.59	16.0	16.0	21.2	35.1	24.7	13.1	0.13
940130	1600	1.84	0.152	0.162	6.59	6.19	18.0	16.0	21.4	37.2	24.7	21.9	0.13
940130	1900	2.12	0.152	0.162	6.59	6.19	24.0	28.0	27.5	31.1	23.9	19.4	0.16
940130	2200	2.29	0.132	0.132	7.56	7.56	22.0	20.0	27.4	26.4	23.3	15.6	0.16
940131	0100	2.23	0.123	0.123	8.16	8.16	10.0	10.0	25.2	29.4	22.0	15.4	0.16
940131	0400	2.28	0.132	0.123	7.56	8.16	12.0	14.0	21.8	31.2	22.6	22.9	0.16
940131	0700	2.20	0.132	0.123	7.56	8.16	10.0	10.0	20.7	34.1	22.4	22.5	0.18
940131	1000	1.89	0.123	0.123	8.16	8.16	10.0	12.0	20.8	33.0	21.4	19.0	0.19
940131	1300	1.61	0.132	0.123	7.56	8.16	12.0	14.0	15.4	28.9	21.9	21.8	0.15
940131	1600	1.49	0.113	0.123	8.87	8.16	8.0	10.0	14.3	26.7	21.5	21.9	0.13
940131	1900	1.32	0.132	0.123	7.56	8.16	10.0	10.0	13.8	31.0	23.4	23.8	0.15
940131	2200	1.21	0.113	0.113	8.87	8.87	2.0	10.0	13.5	31.8	23.5	21.1	0.20
940201	0100	1.14	0.103	0.103	9.71	9.71	0.0	14.0	8.0	28.3	21.6	22.0	0.16
940201	0400	1.10	0.113	0.103	8.87	9.71	0.0	2.0	7.4	27.1	21.9	23.8	0.12
940201	0700	1.11	0.103	0.103	9.71	9.71	-4.0	-4.0	3.9	24.9	22.2	18.8	0.18
940201	1300	0.89	0.113	0.103	8.87	9.71	-6.0	-10.0	-0.4	25.1	21.9	21.4	0.20
940201	1600	0.82	0.103	0.103	9.71	9.71	-6.0	-8.0	1.0	25.3	23.9	20.4	0.13
940201	1900	0.85	0.103	0.103	9.71	9.71	-2.0	-8.0	0.2	26.5	25.6	23.1	0.18
940201	2200	0.84	0.113	0.103	8.87	9.71	-14.0	-12.0	-1.8	26.4	24.5	20.1	0.27
940202	0100	0.85	0.103	0.103	9.71	9.71	-14.0	6.0	10.9	41.0	23.7	20.9	0.23
940202	0400	1.01	0.220	0.103	4.54	9.71	44.0	46.0	25.9	46.2	21.1	20.9	0.14
940202	0700	1.38	0.171	0.181	5.83	5.52	16.0	16.0	19.4	31.4	22.2	17.8	0.13
940202	1000	1.76	0.171	0.171	5.83	5.83	18.0	18.0	29.4	29.6	25.0	15.1	0.16
940202	1300	1.78	0.152	0.162	6.59	6.19	22.0	22.0	26.8	27.7	22.9	19.9	0.15
940202	1600	1.53	0.152	0.152	6.59	6.59	18.0	14.0	24.8	28.9	21.1	17.4	0.14
940202	1900	1.38	0.152	0.152	6.59	6.59	14.0	10.0	19.4	26.2	21.1	15.5	0.13
940202	2200	1.16	0.142	0.152	7.04	6.59	10.0	12.0	18.3	24.5	22.0	14.3	0.15
940203	0100	0.92	0.152	0.152	6.59	6.59	12.0	12.0	18.8	23.6	20.3	9.7	0.15
940203	0400	0.69	0.152	0.103	6.59	9.71	12.0	12.0	12.4	24.0	20.3	25.1	0.14
940203	0700	0.60	0.093	0.093	10.72	10.72	6.0	10.0	7.5	25.4	23.0	24.3	0.15
940203	1000	0.59	0.103	0.103	9.71	9.71	-14.0	-12.0	-7.3	26.4	25.9	23.2	0.26
940203	1300	0.48	0.103	0.103	9.71	9.71	-10.0	-10.0	-11.7	28.7	26.8	25.7	0.28
940203	1600	0.41	0.103	0.103	9.71	9.71	-14.0	-12.0	-16.4	29.8	23.9	22.4	0.28
940203	1900	0.41	0.103	0.103	9.71	9.71	0.0	-52.0	-24.2	44.7	18.5	23.8	0.20
940203	2200	0.38	0.269	0.103	3.72	9.71	-54.0	-52.0	-34.9	37.4	16.2	24.7	0.23
940204	0100	0.31	0.113	0.103	8.87	9.71	-36.0	-54.0	-40.0	36.1	19.5	28.4	0.27
940204	0400	0.28	0.103	0.103	9.71	9.71	-30.0	-52.0	-39.4	34.9	21.9	25.5	0.28
940204	0700	0.26	0.103	0.103	9.71	9.71	-32.0	-34.0	-37.5	30.5	22.9	22.1	0.27
940204	1000	0.30	0.103	0.103	9.71	9.71	-30.0	-36.0	-31.7	47.3	46.2	17.3	0.25
940204	1300	0.38	0.210	0.103	4.75	9.71	32.0	30.0	8.0	60.1	33.8	20.4	0.21
940204	1600	0.35	0.103	0.103	9.71	9.71	-36.0	-36.0	2.0	57.7	39.1	22.5	0.23
940204	1900	0.30	0.103	0.103	9.71	9.71	-24.0	-36.0	-12.5	46.3	33.0	22.0	0.22
940204	2200	0.28	0.103	0.103	9.71	9.71	-32.0	-34.0	-16.3	42.3	33.6	20.7	0.27
940205	0100	0.25	0.103	0.103	9.71	9.71	-30.0	-36.0	-26.9	35.1	31.9	17.4	0.24
940205	0400	0.23	0.113	0.113	8.87	8.87	-36.0	-36.0	-32.2	33.3	32.3	18.1	0.25
940205	0700	0.25	0.113	0.113	8.87	8.87	-26.0	-30.0	-31.8	23.5	21.2	13.4	0.25
940205	1000	0.27	0.113	0.113	8.87	8.87	-30.0	-34.0	-32.8	22.1	19.3	15.3	0.26
940205	1300	0.31	0.113	0.113	8.87	8.87	-26.0	-34.0	-30.9	17.1	16.0	14.6	0.23
940205	1600	0.28	0.113	0.113	8.87	8.87	-30.0	-28.0	-31.0	18.9	19.6	14.0	0.23
940205	1900	0.25	0.113	0.113	8.87	8.87	-36.0	-36.0	-31.6	22.6	23.1	18.4	0.28
940205	2200	0.25	0.113	0.113	8.87	8.87	-34.0	-36.0	-31.7	21.1	20.6	14.6	0.29
940206	0100	0.31	0.142	0.113	7.04	8.87	-42.0	-40.0	-37.2	22.2	20.7	14.2	0.23
940206	0400	0.32	0.132	0.113	7.56	8.87	-40.0	-28.0	-33.2	22.2	23.8	17.4	0.21
940206	0700	0.28	0.142	0.103	7.04	9.71	-40.0	-40.0	-33.0	25.4	23.6	19.9	0.26
940206	1000	0.28	0.123	0.113	8.16	8.87	-20.0	-20.0	-27.9	25.0	24.9	19.2	0.27
940206	1300	0.31	0.123	0.113	8.16	8.87	-38.0	-38.0	-29.2	26.7	28.1	20.1	0.28
940206	1600	0.35	0.113	0.113	8.87	8.87	-36.0	-36.0	-23.7	37.7	28.5	19.0	0.25
940206	1900	0.39	0.123	0.113	8.16	8.87	-36.0	-36.0	-17.3	36.7	22.8	23.8	0.21

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940206	2200	0.47	0.113	0.113	8.87	8.87	-28.0	-36.0	-11.1	39.0	22.5	17.0	0.17
940207	0100	0.52	0.113	0.113	8.87	8.87	-38.0	6.0	-6.4	40.6	24.7	18.9	0.19
940207	0400	0.54	0.113	0.113	8.87	8.87	-28.0	-36.0	-7.7	45.5	24.8	12.2	0.20
940207	0700	0.50	0.113	0.113	8.87	8.87	-22.0	-28.0	-0.4	47.4	27.0	16.5	0.25
940207	1000	0.49	0.113	0.113	8.87	8.87	-32.0	-32.0	-2.1	44.3	24.3	17.2	0.21
940207	1300	0.49	0.113	0.113	8.87	8.87	-20.0	-18.0	-8.8	38.9	25.6	16.3	0.22
940207	1600	0.48	0.113	0.113	8.87	8.87	-32.0	-34.0	-14.6	35.1	25.1	16.9	0.23
940207	1900	0.46	0.103	0.103	9.71	9.71	-24.0	-22.0	-12.5	32.0	26.0	17.7	0.24
940207	2200	0.45	0.113	0.103	8.87	9.71	-24.0	-16.0	-13.5	28.3	24.3	23.6	0.23
940208	0100	0.47	0.103	0.103	9.71	9.71	-12.0	-12.0	-12.9	29.5	27.3	22.8	0.25
940208	0400	0.48	0.103	0.103	9.71	9.71	-32.0	-14.0	-20.1	27.3	26.0	24.1	0.26
940208	0700	0.46	0.103	0.103	9.71	9.71	-34.0	-16.0	-22.3	26.0	24.5	22.2	0.28
940208	1000	0.47	0.103	0.103	9.71	9.71	-26.0	-16.0	-17.2	25.1	23.4	21.1	0.25
940208	1300	0.48	0.103	0.093	9.71	10.72	-32.0	-32.0	-27.4	25.8	24.1	20.3	0.27
940208	1600	0.47	0.093	0.093	10.72	10.72	-36.0	-34.0	-34.6	29.2	25.3	25.9	0.28
940208	1900	0.47	0.093	0.093	10.72	10.72	-16.0	-36.0	-34.4	36.8	22.2	22.6	0.24
940208	2200	0.47	0.103	0.093	9.71	10.72	-30.0	-32.0	-45.3	40.3	23.4	23.5	0.28
940209	0100	0.55	0.132	0.093	7.56	10.72	-42.0	-40.0	-44.6	37.8	25.3	20.5	0.23
940209	0400	0.63	0.132	0.093	7.56	10.72	-46.0	-42.0	-39.6	36.6	37.5	17.9	0.24
940209	0700	0.68	0.123	0.093	8.16	10.72	-42.0	-42.0	-31.7	58.0	46.5	17.6	0.25
940209	1000	0.72	0.132	0.123	7.56	8.16	20.0	20.0	-13.8	62.3	46.2	49.9	0.20
940209	1300	0.74	0.123	0.132	8.16	7.56	14.0	-40.0	-25.7	58.7	47.9	57.4	0.16
940209	1600	0.77	0.123	0.132	8.16	7.56	-40.0	-40.0	-17.7	66.4	51.4	21.3	0.21
940209	1900	0.80	0.123	0.132	8.16	7.56	-44.0	-44.0	-13.0	68.9	64.0	64.9	0.23
940209	2200	1.50	0.250	0.220	4.01	4.54	46.0	44.0	35.4	20.5	17.9	15.0	0.22
940210	0100	2.11	0.162	0.152	6.19	6.59	20.0	20.0	30.2	23.6	19.5	13.9	0.19
940210	0400	2.11	0.132	0.152	7.56	6.59	14.0	16.0	32.4	26.8	21.1	18.8	0.20
940210	0700	2.18	0.142	0.132	7.04	7.56	18.0	20.0	28.5	25.1	20.8	15.3	0.19
940210	1000	2.10	0.142	0.142	7.04	7.04	22.0	22.0	27.0	23.5	20.6	14.8	0.17
940210	1300	2.11	0.132	0.132	7.56	7.56	18.0	18.0	27.7	24.5	22.0	12.1	0.16
940210	1600	2.02	0.103	0.142	9.71	7.04	10.0	12.0	24.2	26.7	23.2	18.4	0.16
940210	1900	2.04	0.142	0.142	7.04	7.04	18.0	16.0	24.5	28.2	24.5	16.4	0.17
940210	2200	2.08	0.152	0.152	6.59	6.59	14.0	12.0	23.8	29.1	24.7	19.1	0.16
940211	0100	1.85	0.152	0.152	6.59	6.59	16.0	12.0	20.2	27.6	24.9	18.0	0.14
940211	0400	1.71	0.142	0.142	7.04	7.04	16.0	14.0	18.9	32.1	29.7	20.2	0.13
940211	0700	1.63	0.152	0.152	6.59	6.59	12.0	10.0	17.0	38.8	35.2	36.9	0.14
940211	1000	1.47	0.093	0.142	10.72	7.04	2.0	4.0	18.5	35.3	29.3	31.5	0.14
940211	1300	1.34	0.103	0.142	9.71	7.04	2.0	8.0	11.9	35.2	29.6	37.5	0.11
940211	1600	1.32	0.103	0.152	9.71	6.59	4.0	14.0	20.4	36.1	34.5	52.0	0.15
940211	1900	1.37	0.113	0.113	8.87	8.87	10.0	12.0	21.6	36.3	29.0	19.5	0.19
940211	2200	1.46	0.308	0.113	3.25	8.87	50.0	48.0	28.5	32.4	20.6	22.3	0.23
940212	0100	1.55	0.171	0.171	5.83	5.83	20.0	16.0	27.5	28.0	18.4	15.1	0.20
940212	0400	1.72	0.152	0.152	6.59	6.59	18.0	18.0	26.7	25.8	19.3	12.3	0.18
940212	0700	1.72	0.142	0.113	7.04	8.87	16.0	16.0	27.8	27.5	20.5	21.5	0.20
940212	1000	1.62	0.103	0.103	9.71	9.71	8.0	14.0	25.0	26.1	18.6	13.4	0.19
940212	1300	1.58	0.103	0.103	9.71	9.71	4.0	14.0	22.3	28.0	18.3	16.6	0.18
940212	1600	1.45	0.103	0.103	9.71	9.71	12.0	12.0	21.6	25.6	19.5	15.7	0.16
940212	1900	1.38	0.103	0.103	9.71	9.71	10.0	12.0	19.5	25.2	20.0	17.8	0.20
940212	2200	1.31	0.103	0.103	9.71	9.71	12.0	12.0	17.3	22.7	18.6	16.3	0.19
940213	0100	1.18	0.093	0.093	10.72	10.72	16.0	12.0	15.3	19.3	18.4	16.1	0.14
940213	0400	1.10	0.093	0.093	10.72	10.72	14.0	14.0	15.7	20.4	19.0	18.2	0.15
940213	0700	1.02	0.093	0.093	10.72	10.72	10.0	12.0	14.0	22.3	20.5	18.0	0.25
940213	1000	0.98	0.093	0.093	10.72	10.72	8.0	8.0	11.4	19.2	19.1	12.2	0.25
940213	1300	0.83	0.093	0.093	10.72	10.72	10.0	10.0	12.1	22.8	22.8	20.7	0.20
940213	1600	0.86	0.093	0.093	10.72	10.72	8.0	8.0	9.3	20.2	21.0	19.1	0.22
940213	1900	0.82	0.093	0.093	10.72	10.72	12.0	10.0	13.0	22.0	24.6	20.7	0.26
940213	2200	0.71	0.093	0.093	10.72	10.72	-4.0	10.0	3.6	24.1	29.2	18.5	0.38

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940214	0100	0.73	0.093	0.093	10.72	10.72	8.0	8.0	17.1	30.8	21.0	18.8	0.21
940214	0400	0.71	0.093	0.093	10.72	10.72	2.0	2.0	17.7	34.2	16.2	16.0	0.18
940214	0700	0.78	0.201	0.093	4.98	10.72	44.0	46.0	27.6	35.6	14.4	16.7	0.18
940214	1000	0.68	0.152	0.103	6.59	9.71	22.0	46.0	25.6	32.9	16.9	25.1	0.19
940214	1300	0.64	0.162	0.103	6.19	9.71	30.0	30.0	21.8	30.5	16.4	15.9	0.17
940214	1600	0.56	0.171	0.093	5.83	10.72	26.0	26.0	19.5	30.0	18.9	22.1	0.16
940214	1900	0.45	0.093	0.093	10.72	10.72	12.0	16.0	17.5	33.3	23.5	31.0	0.19
940214	2200	0.40	0.093	0.093	10.72	10.72	8.0	14.0	15.9	36.6	38.8	24.4	0.23
940215	0100	0.39	0.093	0.093	10.72	10.72	-2.0	12.0	12.2	39.1	41.6	27.2	0.29
940215	0400	0.43	0.103	0.162	9.71	6.19	-10.0	18.0	0.8	37.5	33.9	18.5	0.19
940215	0700	0.46	0.162	0.162	6.19	6.19	20.0	20.0	9.3	35.1	29.0	11.3	0.18
940215	1000	0.42	0.132	0.142	7.56	7.04	18.0	18.0	9.9	38.2	27.7	17.0	0.21
940215	1300	0.37	0.152	0.152	6.59	6.59	24.0	22.0	9.3	38.7	32.2	17.8	0.20
940215	1600	0.35	0.142	0.162	7.04	6.19	14.0	-50.0	-16.5	51.4	29.5	22.4	0.20
940215	1900	0.29	0.103	0.103	9.71	9.71	-34.0	-46.0	-26.0	44.2	30.2	32.4	0.25
940215	2200	0.24	0.103	0.093	9.71	10.72	-34.0	-38.0	-34.2	34.9	29.6	32.3	0.28
940216	0100	0.24	0.093	0.093	10.72	10.72	-30.0	-34.0	-31.1	31.7	25.0	27.7	0.29
940216	0400	0.24	0.132	0.093	7.56	10.72	-40.0	-40.0	-32.6	37.6	30.0	30.5	0.29
940216	0700	0.25	0.103	0.103	9.71	9.71	-30.0	-36.0	-30.0	40.8	30.1	34.3	0.31
940216	1000	0.26	0.103	0.103	9.71	9.71	-34.0	-36.0	-29.1	40.2	38.3	32.5	0.27
940216	1300	0.34	0.318	0.318	3.15	3.15	46.0	46.0	10.2	65.2	35.8	25.4	0.26
940216	1600	0.38	0.191	0.103	5.24	9.71	14.0	10.0	6.7	33.5	29.8	35.8	0.17
940216	1900	0.49	0.162	0.162	6.19	6.19	12.0	14.0	11.3	27.8	24.2	7.4	0.16
940216	2200	0.48	0.171	0.201	5.83	4.98	18.0	18.0	16.2	28.3	23.5	10.6	0.17
940217	0100	0.46	0.171	0.093	5.83	10.72	20.0	20.0	21.0	36.4	26.2	36.3	0.18
940217	0400	0.43	0.181	0.103	5.52	9.71	28.0	18.0	16.6	39.0	26.1	32.2	0.16
940217	0700	0.48	0.103	0.103	9.71	9.71	-34.0	8.0	3.3	34.8	29.3	26.0	0.14
940217	1000	0.54	0.171	0.123	5.83	8.16	-24.0	-12.0	1.9	34.8	31.1	27.0	0.18
940217	1300	0.56	0.201	0.123	4.98	8.16	22.0	-12.0	5.8	35.7	31.0	20.5	0.17
940217	1600	0.60	0.123	0.123	8.16	8.16	0.0	10.0	11.0	33.2	30.0	16.1	0.12
940217	1900	0.62	0.142	0.132	7.04	7.56	4.0	6.0	11.2	33.1	27.3	17.9	0.13
940217	2200	0.62	0.152	0.181	6.59	5.52	-10.0	-10.0	9.8	38.8	30.6	25.6	0.17
940218	0100	0.54	0.162	0.113	6.19	8.87	12.0	2.0	10.1	37.5	33.3	30.7	0.19
940218	0400	0.50	0.132	0.132	7.56	7.56	0.0	2.0	8.4	33.5	33.2	19.4	0.17
940218	0700	0.50	0.142	0.113	7.04	8.87	-8.0	4.0	-2.6	32.1	33.7	32.8	0.17
940218	1000	0.53	0.113	0.113	8.87	8.87	-2.0	2.0	3.9	32.7	35.1	27.7	0.18
940218	1300	0.54	0.093	0.103	10.72	9.71	12.0	10.0	-6.5	34.4	34.6	35.0	0.24
940218	1600	0.58	0.103	0.103	9.71	9.71	0.0	6.0	-3.2	31.4	29.9	23.9	0.18
940218	1900	0.63	0.103	0.103	9.71	9.71	8.0	2.0	-2.8	30.2	28.3	23.8	0.20
940218	2200	0.70	0.103	0.103	9.71	9.71	-14.0	-8.0	-11.2	30.5	28.9	26.2	0.23
940219	0100	0.73	0.093	0.093	10.72	10.72	-4.0	-10.0	-20.1	33.2	28.7	25.9	0.23
940219	0400	0.74	0.093	0.093	10.72	10.72	-4.0	-8.0	-20.1	35.6	24.6	25.9	0.19
940219	0700	0.80	0.093	0.093	10.72	10.72	0.0	-40.0	-23.9	37.5	22.5	23.4	0.16
940219	1000	0.81	0.083	0.103	11.98	9.71	-4.0	-40.0	-29.1	34.4	24.1	27.2	0.18
940219	1300	0.83	0.093	0.093	10.72	10.72	-8.0	-40.0	-34.6	33.3	24.5	19.3	0.15
940219	1600	0.86	0.142	0.113	7.04	8.87	-42.0	-38.0	-35.6	29.8	24.1	22.2	0.15
940219	1900	0.96	0.123	0.123	8.16	8.16	-34.0	-38.0	-34.4	26.5	23.3	17.8	0.14
940219	2200	1.04	0.103	0.103	9.71	9.71	-24.0	-38.0	-34.2	26.0	24.5	23.7	0.15
940220	0100	1.07	0.113	0.103	8.87	9.71	-28.0	-38.0	-36.4	25.0	24.1	27.4	0.19
940220	0400	1.12	0.113	0.103	8.87	9.71	-26.0	-38.0	-33.3	22.5	22.4	21.2	0.15
940220	0700	1.14	0.113	0.103	8.87	9.71	-30.0	-28.0	-29.4	22.0	21.8	26.9	0.14
940220	1000	1.19	0.103	0.103	9.71	9.71	-26.0	-28.0	-31.3	22.4	21.4	22.4	0.14
940220	1300	1.22	0.093	0.093	10.72	10.72	-28.0	-30.0	-32.1	20.4	19.7	15.6	0.16
940220	1600	1.18	0.103	0.103	9.71	9.71	-28.0	-26.0	-30.4	22.5	22.2	19.8	0.17
940220	1900	1.21	0.103	0.103	9.71	9.71	-34.0	-30.0	-33.6	21.3	21.1	19.0	0.15
940220	2200	1.30	0.093	0.093	10.72	10.72	-24.0	-24.0	-30.1	21.3	21.3	17.7	0.15
940221	0100	1.32	0.103	0.103	9.71	9.71	-26.0	-26.0	-30.6	20.5	20.2	16.3	0.19
940221	0400	1.25	0.093	0.093	10.72	10.72	-30.0	-28.0	-31.5	22.3	21.4	19.6	0.18

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940221	0700	1.19	0.093	0.093	10.72	10.72	-24.0	-24.0	-29.3	23.0	23.0	22.6	0.15
940221	1000	1.20	0.093	0.093	10.72	10.72	-34.0	-34.0	-27.9	21.8	21.7	14.0	0.14
940221	1300	1.22	0.093	0.093	10.72	10.72	-24.0	-24.0	-30.3	22.7	22.5	17.0	0.19
940221	1600	1.19	0.093	0.093	10.72	10.72	-18.0	-24.0	-27.9	23.0	22.2	21.4	0.17
940221	1900	1.24	0.093	0.093	10.72	10.72	-32.0	-24.0	-26.5	19.9	19.7	14.3	0.15
940221	2200	1.10	0.093	0.093	10.72	10.72	-22.0	-24.0	-24.6	23.5	23.1	17.6	0.14
940222	0100	1.11	0.093	0.093	10.72	10.72	-22.0	-22.0	-14.7	26.3	21.9	15.0	0.16
940222	0400	0.98	0.093	0.093	10.72	10.72	-22.0	-22.0	-20.2	26.6	24.8	22.7	0.20
940222	0700	0.97	0.093	0.093	10.72	10.72	-34.0	-14.0	-15.5	30.8	24.9	24.4	0.17
940222	1000	0.95	0.093	0.093	10.72	10.72	-4.0	-10.0	0.0	37.3	23.4	23.4	0.12
940222	1300	1.02	0.103	0.103	9.71	9.71	-12.0	-12.0	-1.9	32.0	23.2	20.4	0.13
940222	1600	1.01	0.103	0.103	9.71	9.71	-26.0	-8.0	0.8	39.2	24.5	24.2	0.16
940222	1900	1.01	0.103	0.103	9.71	9.71	-20.0	6.0	5.3	36.9	24.2	24.5	0.14
940222	2200	1.00	0.103	0.103	9.71	9.71	-14.0	18.0	5.5	37.8	24.1	18.4	0.11
940223	0100	1.20	0.103	0.103	9.71	9.71	-12.0	18.0	6.2	38.0	27.5	20.2	0.11
940223	0400	1.10	0.103	0.103	9.71	9.71	-24.0	2.0	10.6	44.8	31.4	21.2	0.14
940223	0700	1.09	0.103	0.103	9.71	9.71	-12.0	2.0	7.4	41.7	34.4	22.9	0.12
940223	1000	1.20	0.162	0.162	6.19	6.19	-34.0	-32.0	-31.8	41.4	44.2	48.0	0.12
940223	1300	1.36	0.142	0.132	7.04	7.56	-40.0	-38.0	-25.5	39.0	41.4	30.3	0.12
940223	1600	1.42	0.123	0.132	8.16	7.56	-8.0	-12.0	-8.0	40.1	40.5	32.3	0.12
940223	1900	1.28	0.132	0.132	7.56	7.56	-40.0	-40.0	-12.8	43.8	44.0	39.0	0.13
940223	2200	1.26	0.132	0.132	7.56	7.56	-38.0	-38.0	-13.3	46.2	46.1	44.3	0.11
940224	0100	1.33	0.132	0.113	7.56	8.87	14.0	12.0	-1.1	44.6	41.2	36.2	0.14
940224	0400	1.31	0.123	0.113	8.16	8.87	12.0	12.0	-6.0	50.2	45.3	33.7	0.17
940224	0700	1.23	0.123	0.113	8.16	8.87	-42.0	6.0	-17.0	52.9	48.4	38.5	0.18
940224	1000	1.07	0.123	0.113	8.16	8.87	-42.0	10.0	-15.9	48.6	46.9	36.4	0.14
940224	1300	0.98	0.123	0.103	8.16	9.71	-42.0	10.0	-6.5	48.8	43.5	35.3	0.14
940224	1600	0.98	0.103	0.113	9.71	8.87	-38.0	-40.0	-21.6	51.8	50.4	41.2	0.20
940224	1900	0.85	0.123	0.113	8.16	8.87	-38.0	-42.0	-9.9	52.5	50.3	44.5	0.23
940224	2200	0.74	0.113	0.113	8.87	8.87	-36.0	4.0	-12.7	45.7	45.4	36.5	0.14
940225	0100	0.66	0.113	0.113	8.87	8.87	-38.0	12.0	4.7	44.7	44.9	34.9	0.15
940225	0400	0.58	0.103	0.113	9.71	8.87	-36.0	-36.0	-1.7	52.5	44.4	34.8	0.21
940225	0700	0.53	0.103	0.103	9.71	9.71	-40.0	-40.0	-11.2	54.3	50.8	34.8	0.25
940225	1000	0.48	0.103	0.103	9.71	9.71	-34.0	-36.0	-0.8	49.3	41.1	32.0	0.20
940225	1300	0.59	0.113	0.113	8.87	8.87	-34.0	14.0	-0.1	41.2	25.2	27.7	0.15
940225	1600	0.60	0.171	0.113	5.83	8.87	18.0	16.0	-2.1	45.4	28.4	34.6	0.20
940225	1900	0.51	0.113	0.113	8.87	8.87	-22.0	12.0	-9.7	46.0	33.7	25.6	0.23
940225	2200	0.48	0.123	0.113	8.16	8.87	-34.0	-34.0	-10.6	39.2	34.4	26.5	0.18
940226	0100	0.46	0.308	0.113	3.25	8.87	-56.0	-32.0	-20.3	36.6	28.4	25.1	0.19
940226	0400	0.43	0.152	0.113	6.59	8.87	-40.0	-38.0	-29.4	33.2	29.5	21.5	0.22
940226	0700	0.46	0.142	0.132	7.04	7.56	-42.0	-42.0	-37.8	29.5	25.4	23.0	0.21
940226	1000	0.88	0.269	0.269	3.72	3.72	62.0	62.0	40.9	28.1	18.8	15.8	0.27
940226	1300	1.27	0.181	0.181	5.52	5.52	36.0	38.0	42.8	18.7	16.9	11.9	0.19
940226	1600	1.75	0.162	0.162	6.19	6.19	40.0	38.0	42.8	21.3	18.0	12.1	0.22
940226	1900	1.60	0.152	0.162	6.59	6.19	40.0	54.0	44.6	22.9	16.5	14.0	0.27
940226	2200	1.67	0.142	0.162	7.04	6.19	24.0	40.0	37.8	21.4	13.6	12.3	0.23
940227	0100	1.41	0.142	0.152	7.04	6.59	20.0	42.0	34.4	22.4	14.9	14.6	0.19
940227	0400	1.32	0.171	0.152	5.83	6.59	36.0	38.0	33.8	18.9	13.1	13.3	0.21
940227	0700	1.40	0.152	0.152	6.59	6.59	32.0	36.0	35.9	22.0	13.5	10.1	0.28
940227	1000	1.54	0.152	0.113	6.59	8.87	30.0	36.0	33.1	22.9	12.4	16.9	0.24
940227	1300	1.28	0.152	0.113	6.59	8.87	22.0	22.0	28.5	25.1	15.2	14.1	0.19
940227	1600	1.30	0.123	0.123	8.16	8.16	12.0	16.0	25.7	24.0	18.3	11.4	0.15
940227	1900	1.19	0.123	0.123	8.16	8.16	12.0	14.0	23.1	21.4	17.3	9.4	0.19
940227	2200	1.09	0.123	0.123	8.16	8.16	12.0	24.0	25.2	22.3	14.9	9.9	0.19
940228	0100	1.20	0.142	0.123	7.04	8.16	20.0	22.0	28.9	25.5	16.3	15.5	0.16
940228	0400	1.13	0.152	0.152	6.59	6.59	24.0	24.0	26.9	24.9	17.6	9.0	0.14
940228	0700	0.99	0.171	0.171	5.83	5.83	26.0	22.0	22.9	25.0	18.0	10.5	0.18
940228	1000	0.94	0.162	0.162	6.19	6.19	30.0	32.0	24.6	23.9	17.5	10.3	0.15

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940228	1300	0.86	0.132	0.123	7.56	8.16	12.0	16.0	17.3	22.2	16.9	16.5	0.11
940228	1600	0.87	0.132	0.132	7.56	7.56	14.0	16.0	13.3	19.9	16.6	11.1	0.11
940228	1900	0.81	0.132	0.132	7.56	7.56	12.0	14.0	12.9	22.7	17.2	12.6	0.17
940228	2200	0.70	0.132	0.132	7.56	7.56	16.0	20.0	14.6	27.5	17.0	13.2	0.17
940301	0100	0.64	0.103	0.113	9.71	8.87	-8.0	-8.0	10.5	30.2	17.7	14.9	0.13
940301	0400	0.61	0.123	0.113	8.16	8.87	-10.0	14.0	10.3	29.7	17.8	16.2	0.14
940301	0700	0.55	0.162	0.162	6.19	6.19	14.0	14.0	6.4	27.1	19.7	10.8	0.18
940301	1000	0.48	0.181	0.113	5.52	8.87	16.0	16.0	7.2	29.3	20.8	18.6	0.21
940301	1300	0.50	0.113	0.123	8.87	8.16	0.0	16.0	10.5	31.2	23.8	15.2	0.15
940301	1600	0.51	0.064	0.318	15.63	3.15	-12.0	-10.0	8.2	35.1	28.8	31.8	0.18
940301	1900	1.10	0.210	0.220	4.75	4.54	20.0	18.0	13.2	33.0	30.2	28.1	0.12
940301	2200	1.59	0.181	0.181	5.52	5.52	12.0	12.0	19.5	28.9	27.8	21.0	0.13
940302	0100	1.90	0.152	0.152	6.59	6.59	12.0	12.0	19.0	22.8	23.2	15.7	0.11
940302	0400	2.14	0.142	0.142	7.04	7.04	10.0	10.0	13.7	26.4	27.2	21.4	0.09
940302	0700	2.04	0.132	0.132	7.56	7.56	12.0	10.0	10.8	35.2	35.4	26.1	0.10
940302	1000	2.06	0.132	0.132	7.56	7.56	10.0	8.0	-10.2	46.0	45.2	34.3	0.15
940302	1300	3.01	0.113	0.113	8.87	8.87	-28.0	-28.0	-29.7	28.0	29.6	16.0	0.23
940302	1600	3.11	0.093	0.093	10.72	10.72	-26.0	-26.0	-25.2	21.2	24.4	13.0	0.25
940302	1900	3.01	0.093	0.083	10.72	11.98	-28.0	-30.0	-28.2	25.4	26.9	19.8	0.24
940302	2200	2.92	0.083	0.083	11.98	11.98	-36.0	-34.0	-26.9	24.5	25.5	14.3	0.23
940303	0100	2.22	0.074	0.074	13.56	13.56	-30.0	-32.0	-19.9	32.9	30.7	19.8	0.20
940303	0400	2.31	0.074	0.074	13.56	13.56	-32.0	-32.0	-20.2	27.3	25.9	18.7	0.21
940303	0700	2.07	0.074	0.074	13.56	13.56	-30.0	-30.0	-18.9	32.9	29.4	21.0	0.20
940303	1000	2.01	0.083	0.083	11.98	11.98	-36.0	-34.0	-22.9	36.0	33.9	32.0	0.21
940303	1300	1.85	0.074	0.083	13.56	11.98	-34.0	-32.0	-20.9	35.8	34.2	32.7	0.20
940303	1600	1.62	0.083	0.083	11.98	11.98	-12.0	8.0	-1.7	38.2	32.2	37.3	0.18
940303	1900	1.61	0.083	0.083	11.98	11.98	6.0	8.0	12.9	40.1	32.8	33.3	0.16
940303	2200	1.45	0.083	0.083	11.98	11.98	2.0	-6.0	11.7	46.7	29.5	33.4	0.26
940304	0100	1.28	0.083	0.083	11.98	11.98	-2.0	10.0	7.6	43.0	27.8	30.2	0.26
940304	0400	1.11	0.074	0.083	13.56	11.98	0.0	4.0	13.7	37.4	24.2	30.7	0.20
940304	0700	1.03	0.083	0.083	11.98	11.98	10.0	16.0	11.8	34.9	25.6	29.2	0.16
940304	1000	0.94	0.074	0.083	13.56	11.98	4.0	14.0	11.3	35.3	26.6	29.1	0.23
940304	1300	0.91	0.083	0.083	11.98	11.98	6.0	12.0	1.6	35.9	28.0	27.2	0.34
940304	1600	0.81	0.083	0.083	11.98	11.98	6.0	8.0	7.3	37.8	34.9	29.7	0.22
940304	1900	0.77	0.083	0.083	11.98	11.98	8.0	10.0	-0.9	38.2	31.7	26.4	0.20
940304	2200	0.68	0.083	0.083	11.98	11.98	2.0	10.0	-15.0	41.7	34.8	28.8	0.24
940305	0100	0.70	0.074	0.083	13.56	11.98	10.0	10.0	-1.4	53.3	46.0	32.0	0.27
940305	0400	0.70	0.074	0.083	13.56	11.98	0.0	44.0	10.3	50.3	31.2	32.4	0.21
940305	0700	0.65	0.083	0.083	11.98	11.98	6.0	10.0	4.4	40.9	30.1	27.9	0.18
940305	1000	0.67	0.074	0.083	13.56	11.98	4.0	6.0	4.9	32.3	25.4	25.9	0.21
940305	1300	0.74	0.181	0.064	5.52	15.63	12.0	12.0	5.9	26.3	23.6	24.1	0.20
940305	1600	0.67	0.074	0.064	13.56	15.63	6.0	10.0	4.0	29.2	23.2	22.6	0.24
940305	1900	0.60	0.074	0.074	13.56	13.56	6.0	-2.0	2.6	30.9	24.5	21.0	0.20
940305	2200	0.54	0.074	0.074	13.56	13.56	8.0	10.0	3.3	32.9	27.1	21.7	0.25
940306	0100	0.51	0.074	0.074	13.56	13.56	8.0	10.0	2.4	34.1	27.2	19.9	0.21
940306	0400	0.57	0.074	0.074	13.56	13.56	4.0	10.0	12.1	48.1	30.5	26.4	0.19
940306	0700	0.69	0.250	0.083	4.01	11.98	24.0	8.0	9.5	34.2	26.0	23.8	0.14
940306	1000	0.81	0.181	0.240	5.52	4.17	6.0	6.0	17.1	32.6	26.9	27.7	0.14
940306	1300	0.90	0.171	0.171	5.83	5.83	22.0	20.0	22.9	33.8	27.3	14.3	0.14
940306	1600	0.88	0.162	0.162	6.19	6.19	36.0	40.0	25.8	33.0	24.5	20.2	0.17
940306	1900	0.80	0.152	0.152	6.59	6.59	22.0	22.0	25.1	31.5	23.6	16.9	0.13
940306	2200	0.67	0.162	0.162	6.19	6.19	22.0	40.0	22.1	38.9	29.0	24.6	0.16
940307	0100	0.60	0.132	0.083	7.56	11.98	4.0	6.0	19.1	39.4	27.1	23.3	0.18
940307	0400	0.52	0.074	0.074	13.56	13.56	-8.0	6.0	14.7	40.7	31.4	23.8	0.21
940307	0700	0.48	0.074	0.074	13.56	13.56	10.0	6.0	9.3	37.5	32.2	24.2	0.20
940307	1000	0.50	0.083	0.074	11.98	13.56	-6.0	-10.0	-14.4	40.8	36.7	24.7	0.18
940307	1300	0.51	0.083	0.083	11.98	11.98	-6.0	-10.0	-33.0	48.9	37.8	21.5	0.21
940307	1600	0.54	0.074	0.083	13.56	11.98	-12.0	-40.0	-45.4	52.4	32.0	24.7	0.23

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940307	1900	0.52	0.181	0.074	5.52	13.56	-54.0	-40.0	-37.2	44.4	26.3	23.9	0.23
940307	2200	0.51	0.083	0.083	11.98	11.98	10.0	-38.0	-30.2	38.8	25.5	24.9	0.18
940308	0100	0.53	0.171	0.171	5.83	5.83	-50.0	-48.0	-35.4	35.4	23.4	13.3	0.19
940308	0400	0.56	0.162	0.162	6.19	6.19	-46.0	-44.0	-37.9	30.2	20.2	9.6	0.20
940308	0700	0.54	0.132	0.132	7.56	7.56	-40.0	-40.0	-33.9	28.0	20.9	21.1	0.18
940308	1000	0.53	0.152	0.152	6.59	6.59	-40.0	-40.0	-33.7	28.1	19.2	15.4	0.17
940308	1300	0.51	0.142	0.142	7.04	7.04	-40.0	-42.0	-35.7	25.3	15.8	11.0	0.20
940308	1600	0.52	0.152	0.152	6.59	6.59	-40.0	-40.0	-37.0	22.7	14.6	8.6	0.18
940308	1900	0.47	0.142	0.152	7.04	6.59	-38.0	-40.0	-37.7	20.5	15.2	12.8	0.19
940308	2200	0.96	0.210	0.210	4.75	4.75	50.0	52.0	38.1	25.2	18.1	11.9	0.18
940309	0100	1.30	0.191	0.181	5.24	5.52	34.0	32.0	31.3	26.9	24.9	18.2	0.15
940309	0400	1.43	0.171	0.181	5.83	5.52	22.0	18.0	28.5	35.5	32.0	24.5	0.12
940309	0700	1.46	0.162	0.152	6.19	6.59	18.0	10.0	30.6	35.4	27.9	22.7	0.17
940309	1000	1.30	0.152	0.152	6.59	6.59	12.0	10.0	24.5	29.4	26.1	12.5	0.12
940309	1300	1.28	0.152	0.152	6.59	6.59	20.0	12.0	24.7	28.3	25.9	16.6	0.12
940309	1600	1.36	0.152	0.152	6.59	6.59	16.0	18.0	20.4	30.6	25.8	19.5	0.14
940309	1900	1.23	0.142	0.142	7.04	7.04	22.0	16.0	20.7	30.7	26.9	20.8	0.14
940309	2200	1.18	0.142	0.142	7.04	7.04	16.0	16.0	20.1	33.9	34.5	27.6	0.10
940310	0100	1.24	0.142	0.142	7.04	7.04	14.0	12.0	8.3	49.7	49.8	49.1	0.13
940310	0400	1.22	0.142	0.142	7.04	7.04	-38.0	-38.0	-27.0	49.0	43.7	45.9	0.15
940310	0700	1.22	0.123	0.132	8.16	7.56	-42.0	-42.0	-38.9	46.5	38.6	43.7	0.14
940310	1000	1.13	0.132	0.123	7.56	8.16	-38.0	-38.0	-38.3	24.3	24.0	21.5	0.14
940310	1300	1.02	0.123	0.123	8.16	8.16	-38.0	-38.0	-40.6	27.0	24.5	18.9	0.18
940310	1600	1.12	0.123	0.123	8.16	8.16	-40.0	-40.0	-38.1	27.1	25.8	25.7	0.15
940310	1900	1.33	0.210	0.123	4.75	8.16	50.0	58.0	18.6	76.8	24.7	26.4	0.20
940310	2200	1.72	0.191	0.181	5.24	5.52	38.0	42.0	30.7	23.4	17.2	13.2	0.21
940311	0100	1.81	0.171	0.171	5.83	5.83	40.0	52.0	35.5	26.3	20.2	17.3	0.24
940311	0400	1.90	0.162	0.162	6.19	6.19	38.0	36.0	36.8	24.7	19.5	15.2	0.21
940311	0700	1.63	0.162	0.162	6.19	6.19	40.0	38.0	35.1	26.5	16.5	15.8	0.20
940311	1000	1.43	0.142	0.152	7.04	6.59	22.0	36.0	32.2	25.4	16.2	15.1	0.19
940311	1300	1.25	0.152	0.142	6.59	7.04	28:0	26.0	33.2	24.3	16.3	13.4	0.17
940311	1600	1.28	0.142	0.142	7.04	7.04	20.0	52.0	34.5	29.3	17.3	11.9	0.21
940311	1900	1.23	0.152	0.152	6.59	6.59	26.0	24.0	28.7	26.4	17.1	8.8	0.20
940311	2200	1.00	0.132	0.123	7.56	8.16	16.0	16.0	24.2	32.0	19.6	16.7	0.17
940312	0100	1.01	0.132	0.132	7.56	7.56	16.0	16.0	20.9	29.5	20.9	13.4	0.14
940312	0400	1.14	0.142	0.142	7.04	7.04	16.0	12.0	22.2	32.6	24.9	14.0	0.17
940312	0700	1.23	0.142	0.103	7.04	9.71	16.0	18.0	23.3	29.8	22.9	29.1	0.17
940312	1000	1.15	0.152	0.103	6.59	9.71	16.0	10.0	20.8	26.7	23.1	23.4	0.13
940312	1300	1.07	0.113	0.103	8.87	9.71	6.0	8.0	13.1	24.8	20.5	21.5	0.10
940312	1600	1.10	0.103	0.103	9.71	9.71	4.0	8.0	16.0	27.2	23.1	19.6	0.13
940312	1900	1.02	0.103	0.103	9.71	9.71	6.0	4.0	14.4	27.2	24.0	26.0	0.17
940312	2200	0.95	0.103	0.103	9.71	9.71	6.0	6.0	11.9	24.8	23.3	21.2	0.16
940313	0100	0.90	0.093	0.103	10.72	9.71	2.0	4.0	8.4	26.3	24.8	25.3	0.11
940313	0400	0.88	0.103	0.103	9.71	9.71	2.0	2.0	4.3	26.7	25.9	21.5	0.13
940313	0700	0.86	0.103	0.093	9.71	10.72	0.0	2.0	6.8	26.3	27.2	20.8	0.21
940313	1000	0.82	0.093	0.093	10.72	10.72	8.0	2.0	6.8	26.4	27.8	20.5	0.17
940313	1300	0.84	0.093	0.103	10.72	9.71	2.0	2.0	4.2	25.9	27.1	22.7	0.13
940313	1600	0.94	0.093	0.093	10.72	10.72	6.0	2.0	2.5	23.7	24.7	20.2	0.15
940313	1900	0.93	0.093	0.093	10.72	10.72	6.0	-4.0	-0.7	24.2	24.6	22.8	0.24
940313	2200	0.85	0.083	0.083	11.98	11.98	2.0	2.0	0.3	24.8	25.3	21.2	0.22
940314	0100	0.80	0.093	0.093	10.72	10.72	4.0	4.0	-2.0	27.1	26.0	21.6	0.14
940314	0400	0.76	0.093	0.093	10.72	10.72	8.0	4.0	-4.8	29.9	28.3	24.2	0.15
940314	0700	0.75	0.093	0.093	10.72	10.72	0.0	-2.0	-13.7	33.4	28.3	23.8	0.22
940314	1000	0.68	0.093	0.093	10.72	10.72	6.0	-4.0	-13.3	34.0	29.3	24.2	0.21
940314	1300	1.09	0.250	0.269	4.01	3.72	54.0	54.0	33.3	47.2	16.7	8.9	0.36
940314	1600	0.92	0.220	0.220	4.54	4.54	56.0	54.0	31.5	54.5	19.3	7.8	0.23
940314	1900	0.68	0.093	0.103	10.72	9.71	-2.0	58.0	15.8	56.7	27.5	26.2	0.25
940314	2200	0.67	0.103	0.103	9.71	9.71	0.0	2.0	10.4	30.5	25.2	24.1	0.20

(Sheet 24 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940315	0100	0.71	0.103	0.103	9.71	9.71	0.0	4.0	9.8	28.5	22.5	25.5	0.13
940315	0400	0.76	0.103	0.103	9.71	9.71	4.0	2.0	8.1	27.1	23.1	22.3	0.12
940315	0700	0.78	0.113	0.113	8.87	8.87	0.0	2.0	6.0	27.8	25.7	14.5	0.16
940315	1000	0.72	0.113	0.113	8.87	8.87	4.0	6.0	0.9	28.9	29.1	27.5	0.20
940315	1300	0.69	0.123	0.123	8.16	8.16	4.0	4.0	1.4	25.7	26.7	18.5	0.16
940315	1600	0.66	0.093	0.103	10.72	9.71	-6.0	4.0	-3.6	27.2	25.4	22.5	0.16
940315	1900	0.60	0.093	0.093	10.72	10.72	-4.0	2.0	-6.9	26.9	27.0	23.6	0.23
940315	2200	0.59	0.083	0.093	11.98	10.72	6.0	-10.0	-3.2	27.0	27.4	27.8	0.25
940316	0100	0.57	0.083	0.093	11.98	10.72	4.0	4.0	-2.7	27.0	27.1	25.4	0.23
940316	0400	0.56	0.103	0.103	9.71	9.71	2.0	4.0	-6.5	32.2	29.0	22.2	0.22
940316	0700	0.72	0.289	0.093	3.47	10.72	64.0	6.0	11.1	48.2	25.8	25.1	0.32
940316	1000	0.96	0.250	0.240	4.01	4.17	56.0	56.0	34.8	49.6	20.0	15.3	0.31
940316	1300	0.81	0.240	0.093	4.17	10.72	52.0	52.0	27.6	50.7	20.1	22.9	0.22
940316	1600	0.82	0.093	0.093	10.72	10.72	-2.0	50.0	26.2	46.9	25.0	20.4	0.15
940316	1900	0.97	0.201	0.201	4.98	4.98	46.0	46.0	32.7	36.4	21.1	15.9	0.16
940316	2200	1.68	0.162	0.162	6.19	6.19	42.0	42.0	38.0	17.0	14.9	10.4	0.19
940317	0100	1.38	0.162	0.152	6.19	6.59	40.0	40.0	31.8	18.5	13.6	11.9	0.16
940317	0400	1.25	0.152	0.142	6.59	7.04	34.0	34.0	28.0	18.3	11.7	11.9	0.17
940317	0700	1.06	0.152	0.152	6.59	6.59	32.0	42.0	31.5	20.0	11.2	8.3	0.20
940317	1000	1.03	0.142	0.142	7.04	7.04	30.0	42.0	35.7	15.9	10.2	8.0	0.19
940317	1300	0.77	0.171	0.152	5.83	6.59	38.0	38.0	29.8	17.0	11.7	9.7	0.17
940317	1600	0.71	0.152	0.152	6.59	6.59	24.0	26.0	24.8	20.9	12.3	8.0	0.15
940317	1900	0.64	0.162	0.162	6.19	6.19	30.0	30.0	21.5	22.7	14.7	9.0	0.18
940317	2200	0.58	0.132	0.132	7.56	7.56	14.0	14.0	21.5	25.8	17.2	9.4	0.18
940318	0100	0.48	0.123	0.123	8.16	8.16	12.0	12.0	18.2	27.3	21.5	8.7	0.24
940318	0400	0.45	0.142	0.142	7.04	7.04	14.0	14.0	12.6	26.2	26.7	12.1	0.18
940318	0700	0.47	0.152	0.083	6.59	11.98	26.0	14.0	8.7	31.4	29.0	27.5	0.21
940318	1000	0.49	0.318	0.083	3.15	11.98	-56.0	-56.0	-12.8	60.5	21.7	24.4	0.23
940318	1300	0.43	0.152	0.152	6.59	6.59	16.0	16.0	-12.7	54.8	24.4	7.9	0.20
940318	1600	0.35	0.152	0.152	6.59	6.59	14.0	14.0	-17.6	50.7	36.8	40.6	0.20
940318	1900	0.42	0.132	0.132	7.56	7.56	-40.0	-40.0	-33.6	35.8	32.2	18.7	0.20
940318	2200	0.45	0.123	0.123	8.16	8.16	-42.0	-40.0	-17.0	38.7	31.7	19.8	0.19
940319	0100	0.47	0.123	0.123	8.16	8.16	-40.0	-38.0	-26.1	29.4	20.8	16.9	0.22
940319	0400	0.70	0.289	0.289	3.47	3.47	56.0	56.0	32.6	36.8	15.2	10.7	0.37
940319	0700	1.60	0.171	0.171	5.83	5.83	38.0	46.0	42.2	12.0	11.5	6.4	0.23
940319	1000	1.40	0.152	0.162	6.59	6.19	30.0	36.0	40.3	15.0	12.9	9.4	0.23
940319	1300	0.94	0.152	0.152	6.59	6.59	30.0	34.0	33.8	18.8	14.1	9.6	0.17
940319	1600	0.80	0.152	0.152	6.59	6.59	22.0	24.0	25.1	23.8	17.4	9.4	0.13
940319	1900	0.67	0.162	0.123	6.19	8.16	24.0	22.0	18.2	33.6	22.4	31.7	0.14
940319	2200	0.60	0.132	0.123	7.56	8.16	14.0	16.0	13.4	38.1	24.6	28.7	0.19
940320	0100	0.46	0.132	0.132	7.56	7.56	12.0	14.0	9.1	45.3	34.4	23.8	0.21
940320	0400	0.42	0.142	0.142	7.04	7.04	12.0	12.0	4.2	42.2	30.4	12.2	0.18
940320	0700	0.39	0.162	0.103	6.19	9.71	18.0	18.0	5.6	42.0	29.8	23.4	0.15
940320	1000	0.38	0.171	0.123	5.83	8.16	16.0	16.0	0.9	41.6	31.3	27.0	0.17
940320	1300	0.41	0.123	0.123	8.16	8.16	-6.0	16.0	4.6	37.8	30.1	23.4	0.17
940320	1600	0.43	0.123	0.123	8.16	8.16	-16.0	18.0	-1.7	36.6	27.3	21.6	0.15
940320	1900	0.39	0.123	0.123	8.16	8.16	-6.0	4.0	-0.9	38.6	28.9	25.4	0.16
940320	2200	0.35	0.142	0.132	7.04	7.56	-12.0	-16.0	-4.9	40.3	33.6	27.8	0.16
940321	0100	0.32	0.220	0.123	4.54	8.16	28.0	-14.0	1.8	47.6	34.2	24.1	0.19
940321	0400	0.32	0.113	0.123	8.87	8.16	-12.0	-12.0	1.6	42.5	37.6	24.1	0.17
940321	0700	0.37	0.113	0.123	8.87	8.16	-2.0	-16.0	2.1	35.8	32.3	23.2	0.16
940321	1000	0.43	0.123	0.123	8.16	8.16	-2.0	-2.0	2.7	35.7	35.8	20.4	0.14
940321	1300	0.48	0.152	0.132	6.59	7.56	-16.0	-16.0	-8.5	35.2	37.9	27.9	0.14
940321	1600	0.51	0.132	0.142	7.56	7.04	-10.0	-10.0	-5.9	31.5	35.6	21.5	0.14
940321	1900	0.63	0.289	0.259	3.47	3.86	-62.0	-62.0	-41.5	47.7	22.7	16.3	0.23
940321	2200	0.62	0.308	0.308	3.25	3.25	-60.0	-58.0	-39.5	41.0	21.4	6.9	0.26
940322	0100	0.78	0.132	0.132	7.56	7.56	-42.0	-42.0	-42.7	32.5	31.1	32.1	0.17
940322	0400	0.75	0.132	0.132	7.56	7.56	-40.0	-42.0	-32.1	30.6	31.0	30.0	0.15

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940322	0700	0.79	0.308	0.132	3.25	7.56	60.0	58.0	2.3	82.2	21.9	22.6	0.23
940322	1000	0.85	0.279	0.279	3.59	3.59	58.0	58.0	22.6	79.2	22.6	17.5	0.27
940322	1300	0.80	0.240	0.240	4.17	4.17	56.0	56.0	30.8	53.4	23.5	10.5	0.22
940322	1600	0.65	0.201	0.210	4.98	4.75	48.0	50.0	36.1	48.1	21.5	11.1	0.21
940322	1900	0.57	0.191	0.191	5.24	5.24	46.0	46.0	26.6	43.4	23.7	17.4	0.14
940322	2200	0.51	0.191	0.191	5.24	5.24	42.0	40.0	21.2	44.9	26.0	15.5	0.14
940323	0100	0.45	0.191	0.123	5.24	8.16	38.0	38.0	4.2	49.8	32.2	30.9	0.19
940323	0400	0.40	0.113	0.123	8.87	8.16	-8.0	-8.0	-1.4	40.3	35.3	30.3	0.22
940323	0700	0.34	0.103	0.103	9.71	9.71	-4.0	-2.0	-0.6	36.3	38.2	18.4	0.24
940323	1000	0.33	0.103	0.113	9.71	8.87	2.0	4.0	-0.4	31.7	34.3	22.0	0.21
940323	1300	0.34	0.103	0.113	9.71	8.87	-12.0	-10.0	-10.7	24.4	28.1	15.8	0.20
940323	1600	0.35	0.113	0.113	8.87	8.87	-2.0	-50.0	-22.7	41.9	22.4	16.8	0.23
940323	1900	0.25	0.113	0.113	8.87	8.87	-6.0	-8.0	-22.3	36.8	28.7	20.3	0.24
940323	2200	0.21	0.064	0.074	15.63	13.56	-10.0	-12.0	-21.9	33.3	28.0	25.2	0.27
940324	0100	0.20	0.074	0.074	13.56	13.56	4.0	-36.0	-22.5	36.6	28.6	23.3	0.35
940324	0400	0.21	0.181	0.074	5.52	13.56	-50.0	-34.0	-27.1	37.5	28.4	33.7	0.30
940324	0700	0.24	0.191	0.083	5.24	11.98	-30.0	-32.0	-19.8	35.7	25.5	32.8	0.31
940324	1000	0.25	0.103	0.093	9.71	10.72	0.0	-30.0	-17.0	34.4	23.8	26.2	0.29
940324	1300	0.27	0.308	0.103	3.25	9.71	-54.0	-54.0	-26.9	46.5	26.5	29.5	0.34
940324	1600	0.36	0.279	0.279	3.59	3.59	-58.0	-58.0	-42.0	37.6	13.9	4.5	0.36
940324	1900	0.30	0.289	0.064	3.47	15.63	-58.0	-58.0	-33.1	51.2	21.1	21.0	0.33
940324	2200	0.31	0.171	0.064	5.83	15.63	-46.0	-46.0	-26.2	46.3	23.0	23.8	0.30
940325	0100	0.39	0.162	0.162	6.19	6.19	-46.0	-46.0	-32.1	38.2	22.0	10.2	0.23
940325	0400	0.48	0.152	0.162	6.59	6.19	-46.0	-46.0	-40.1	27.3	19.5	13.3	0.19
940325	0700	0.47	0.171	0.171	5.83	5.83	-50.0	-50.0	-36.2	33.2	17.9	8.5	0.22
940325	1000	0.50	0.152	0.142	6.59	7.04	-44.0	-44.0	-34.6	32.6	16.1	10.8	0.22
940325	1300	0.76	0.142	0.142	7.04	7.04	-42.0	90.0	28.3	116.1	24.4	10.4	0.25
940325	1600	1.12	0.210	0.210	4.75	4.75	38.0	38.0	38.4	38.3	27.0	21.8	0.19
940325	1900	0.93	0.230	0.230	4.35	4.35	56.0	58.0	29.2	50.4	27.4	22.8	0.26
940325	2200	0.77	0.230	0.210	4.35	4.75	46.0	52.0	21.3	53.5	27.3	17.8	0.21
940326	0100	1.26	0.210	0.210	4.75	4.75	50.0	52.0	40.7	26.2	19.4	12.0	0.23
940326	0400	1.46	0.191	0.191	5.24	5.24	46.0	46.0	42.7	21.7	19.1	13.1	0.22
940326	0700	1.43	0.162	0.162	6.19	6.19	24.0	16.0	32.8	28.8	22.3	15.6	0.17
940326	1000	1.26	0.162	0.162	6.19	6.19	26.0	28.0	28.8	28.3	22.4	15.7	0.14
940326	1300	1.19	0.142	0.142	7.04	7.04	18.0	20.0	20.5	29.1	21.2	20.5	0.12
940326	1600	1.08	0.132	0.142	7.56	7.04	14.0	24.0	20.4	28.9	23.5	19.7	0.17
940326	1900	0.87	0.162	0.132	6.19	7.56	30.0	18.0	16.2	30.7	25.4	29.5	0.18
940326	2200	0.78	0.113	0.113	8.87	8.87	6.0	10.0	13.3	28.4	23.5	18.2	0.12
940327	0100	0.83	0.103	0.123	9.71	8.16	0.0	2.0	8.6	30.4	26.6	21.4	0.13
940327	0400	0.92	0.113	0.142	8.87	7.04	-2.0	2.0	4.7	35.0	31.8	35.0	0.14
940327	0700	0.76	0.123	0.123	8.16	8.16	0.0	-2.0	5.9	39.3	36.9	25.4	0.16
940327	1000	0.92	0.279	0.259	3.59	3.86	-66.0	-62.0	-43.2	50.8	28.6	23.0	0.23
940327	1300	1.13	0.162	0.152	6.19	6.59	-40.0	-38.0	-39.8	25.7	18.8	18.9	0.21
940327	1600	1.06	0.132	0.132	7.56	7.56	-38.0	-38.0	-36.2	29.6	27.2	24.7	0.16
940327	1900	0.84	0.123	0.132	8.16	7.56	-40.0	-40.0	-36.5	31.8	29.1	27.8	0.18
940327	2200	0.77	0.123	0.123	8.16	8.16	-38.0	-40.0	-35.2	31.0	23.3	24.3	0.15
940328	0100	0.78	0.123	0.123	8.16	8.16	-38.0	-38.0	-40.0	27.0	20.5	25.8	0.17
940328	0400	0.70	0.132	0.123	7.56	8.16	-38.0	-40.0	-40.2	25.1	21.1	26.5	0.17
940328	0700	0.69	0.142	0.132	7.04	7.56	-40.0	-50.0	-41.5	27.3	18.2	25.3	0.19
940328	1000	0.63	0.132	0.123	7.56	8.16	-38.0	-40.0	-42.9	27.9	15.2	25.1	0.17
940328	1300	0.64	0.142	0.132	7.04	7.56	-40.0	-40.0	-45.0	28.9	13.7	23.9	0.15
940328	1600	0.63	0.152	0.142	6.59	7.04	-42.0	-42.0	-44.9	27.4	25.2	16.0	0.15
940328	1900	0.59	0.142	0.132	7.04	7.56	-44.0	-44.0	-41.6	27.8	24.3	18.8	0.22
940328	2200	0.53	0.132	0.132	7.56	7.56	-42.0	-42.0	-42.3	31.0	27.3	23.6	0.21
940329	0100	0.50	0.113	0.113	8.87	8.87	-40.0	-40.0	-42.1	33.0	29.2	25.1	0.14
940329	1000	0.46	0.123	0.123	8.16	8.16	-40.0	-40.0	-38.1	32.2	28.7	18.8	0.26
940329	1300	0.56	0.318	0.103	3.15	9.71	42.0	42.0	-2.5	73.2	26.0	30.3	0.27
940329	1600	0.77	0.191	0.113	5.24	8.87	44.0	44.0	15.2	57.4	18.7	22.3	0.18

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940329	1900	0.64	0.201	0.103	4.98	9.71	44.0	42.0	3.0	68.3	21.4	22.9	0.24
940329	2200	0.57	0.103	0.103	9.71	9.71	-24.0	-24.0	-18.0	34.6	21.5	14.9	0.34
940330	0100	0.48	0.103	0.103	9.71	9.71	-26.0	-28.0	-5.8	52.6	23.8	23.3	0.21
940330	0400	0.52	0.103	0.103	9.71	9.71	-30.0	40.0	3.8	51.1	25.9	29.3	0.15
940330	0700	0.60	0.181	0.181	5.52	5.52	26.0	40.0	10.7	43.9	23.1	14.6	0.18
940330	1000	0.58	0.210	0.123	4.75	8.16	38.0	40.0	16.9	40.9	24.8	33.1	0.19
940330	1300	0.63	0.171	0.162	5.83	6.19	24.0	24.0	19.1	35.7	21.8	14.2	0.11
940330	1600	0.67	0.162	0.142	6.19	7.04	18.0	16.0	14.1	33.5	25.1	23.5	0.10
940330	1900	0.66	0.152	0.152	6.59	6.59	14.0	16.0	12.8	32.3	28.5	19.9	0.14
940330	2200	0.55	0.123	0.123	8.16	8.16	-6.0	18.0	10.7	35.7	31.9	20.3	0.18
940331	0100	0.51	0.132	0.123	7.56	8.16	-6.0	-4.0	6.1	30.3	26.1	22.2	0.14
940331	0400	0.47	0.132	0.132	7.56	7.56	0.0	0.0	3.4	28.1	26.4	18.3	0.11
940331	0700	0.47	0.142	0.142	7.04	7.04	-2.0	0.0	5.2	32.1	31.6	22.2	0.15
940331	1000	0.47	0.132	0.132	7.56	7.56	8.0	8.0	3.4	38.5	39.6	26.9	0.17
940331	1300	0.52	0.132	0.132	7.56	7.56	6.0	-38.0	-10.8	41.3	30.7	20.7	0.15
940331	1600	0.85	0.142	0.142	7.04	7.04	-38.0	-38.0	-21.5	30.9	31.7	36.8	0.12
940331	1900	1.23	0.142	0.142	7.04	7.04	-10.0	-14.0	-15.2	29.8	30.4	24.2	0.14
940331	2200	1.14	0.132	0.132	7.56	7.56	-6.0	-10.0	-13.6	30.0	30.3	25.9	0.15
940401	0100	1.04	0.123	0.132	8.16	7.56	-4.0	-10.0	-8.4	27.6	26.8	23.4	0.13
940401	0400	0.87	0.132	0.132	7.56	7.56	-12.0	-12.0	-5.5	30.9	25.6	23.7	0.11
940401	0700	0.79	0.132	0.132	7.56	7.56	-16.0	-12.0	8.7	60.1	22.9	23.2	0.13
940401	1000	1.03	0.240	0.240	4.17	4.17	56.0	56.0	41.3	23.6	15.8	8.6	0.27
940401	1300	0.81	0.210	0.230	4.75	4.35	50.0	54.0	37.6	31.9	17.5	11.8	0.28
940401	1600	0.53	0.132	0.123	7.56	8.16	16.0	26.0	20.3	36.0	26.3	31.7	0.15
940401	1900	0.73	0.152	0.142	6.59	7.04	28.0	30.0	21.3	28.3	21.4	32.3	0.15
940401	2200	0.80	0.132	0.142	7.56	7.04	12.0	14.0	19.2	24.0	19.1	14.1	0.21
940402	0100	0.79	0.093	0.093	10.72	10.72	4.0	10.0	11.6	22.6	20.3	18.1	0.23
940402	0400	0.77	0.093	0.093	10.72	10.72	8.0	10.0	12.3	21.4	20.9	16.4	0.12
940402	0700	0.74	0.103	0.103	9.71	9.71	2.0	10.0	10.0	23.0	23.9	17.4	0.12
940402	1000	0.72	0.113	0.103	8.87	9.71	0.0	12.0	7.1	26.6	26.6	20.3	0.18
940402	1300	0.65	0.103	0.113	9.71	8.87	2.0	4.0	5.8	26.6	26.1	20.2	0.21
940402	1600	0.63	0.113	0.113	8.87	8.87	8.0	6.0	3.8	25.7	26.0	21.6	0.14
940402	1900	0.62	0.113	0.113	8.87	8.87	0.0	0.0	0.4	27.3	27.1	21.8	0.14
940402	2200	0.62	0.113	0.113	8.87	8.87	2.0	2.0	-2.6	26.7	25.5	16.1	0.21
940403	0100	0.62	0.113	0.113	8.87	8.87	6.0	4.0	-3.5	27.1	26.1	21.5	0.28
940403	0400	0.65	0.103	0.103	9.71	9.71	6.0	2.0	-3.0	25.9	26.2	22.5	0.19
940403	0700	0.63	0.103	0.103	9.71	9.71	-4.0	-6.0	-5.7	25.7	25.6	18.4	0.14
940403	1000	0.61	0.113	0.113	8.87	8.87	-4.0	-6.0	-0.3	29.2	28.8	23.1	0.18
940403	1300	0.57	0.113	0.123	8.87	8.16	-8.0	-10.0	-7.5	32.2	30.0	30.2	0.26
940403	1600	0.52	0.113	0.113	8.87	8.87	4.0	-8.0	-8.5	30.5	28.7	26.5	0.27
940403	1900	0.48	0.113	0.113	8.87	8.87	-8.0	-8.0	-12.4	28.2	26.7	23.4	0.17
940403	2200	0.53	0.162	0.132	6.19	7.56	-44.0	-44.0	-24.8	36.0	26.6	28.1	0.20
940404	0100	0.53	0.152	0.152	6.59	6.59	-44.0	-44.0	-32.5	36.6	26.0	20.0	0.22
940404	0400	0.49	0.162	0.132	6.19	7.56	-44.0	-44.0	-33.7	33.7	25.4	28.5	0.24
940404	0700	0.66	0.142	0.269	7.04	3.72	-40.0	-38.0	10.0	83.1	26.0	24.1	0.18
940404	1000	0.79	0.259	0.269	3.86	3.72	48.0	44.0	15.9	63.4	31.0	26.3	0.16
940404	1300	0.83	0.250	0.250	4.01	4.01	36.0	36.0	18.5	46.5	29.2	22.0	0.16
940404	1600	0.82	0.240	0.230	4.17	4.35	46.0	4.0	14.0	50.6	35.4	34.9	0.13
940404	1900	0.83	0.181	0.191	5.52	5.24	14.0	16.0	9.5	35.2	31.1	18.4	0.11
940404	2200	0.77	0.191	0.191	5.24	5.24	32.0	8.0	13.5	49.7	35.0	23.3	0.12
940405	0100	0.80	0.181	0.181	5.52	5.52	18.0	16.0	10.2	41.6	36.7	14.1	0.14
940405	0400	0.77	0.171	0.171	5.83	5.83	20.0	26.0	17.1	40.2	25.5	12.5	0.16
940405	0700	0.69	0.132	0.132	7.56	7.56	-4.0	-2.0	7.3	41.5	23.4	16.9	0.14
940405	1000	0.74	0.142	0.113	7.04	8.87	-2.0	-2.0	9.3	36.2	28.3	27.5	0.12
940405	1300	0.73	0.142	0.113	7.04	8.87	-2.0	0.0	6.1	38.3	33.3	30.5	0.15
940405	1600	0.64	0.113	0.113	8.87	8.87	-18.0	4.0	6.0	37.6	36.6	25.3	0.16
940405	1900	0.57	0.113	0.113	8.87	8.87	-20.0	-16.0	-6.2	35.6	35.8	24.6	0.15
940405	2200	0.57	0.123	0.113	8.16	8.87	-32.0	-14.0	-5.4	34.1	34.8	31.4	0.15

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940406	0100	0.56	0.113	0.113	8.87	8.87	-16.0	-16.0	-16.3	32.8	33.2	24.0	0.25
940406	0400	0.55	0.113	0.113	8.87	8.87	-18.0	-14.0	-13.7	30.2	30.3	20.7	0.25
940406	0700	0.56	0.113	0.113	8.87	8.87	-14.0	-12.0	-25.6	36.2	29.7	25.4	0.21
940406	1000	0.67	0.171	0.113	5.83	8.87	-42.0	-42.0	-30.6	31.9	21.9	22.8	0.15
940406	1300	0.73	0.191	0.113	5.24	8.87	-48.0	-38.0	-31.5	31.0	21.2	30.0	0.21
940406	1600	0.87	0.289	0.113	3.47	8.87	-56.0	-54.0	-39.9	32.2	15.6	27.0	0.28
940406	1900	0.65	0.113	0.103	8.87	9.71	-12.0	-56.0	-33.0	38.1	18.0	27.1	0.27
940406	2200	0.60	0.142	0.113	7.04	8.87	-38.0	-38.0	-25.9	33.7	22.3	27.5	0.17
940407	0100	0.65	0.142	0.113	7.04	8.87	-38.0	-38.0	-29.7	31.0	23.7	21.9	0.22
940407	0400	0.68	0.132	0.103	7.56	9.71	-38.0	-38.0	-30.4	29.3	23.7	20.5	0.24
940407	0700	0.63	0.132	0.103	7.56	9.71	-38.0	-38.0	-30.3	27.9	23.0	20.9	0.28
940407	1000	0.57	0.152	0.103	6.59	9.71	-36.0	-38.0	-27.9	31.1	25.9	27.0	0.18
940407	1300	0.55	0.103	0.103	9.71	9.71	-10.0	-38.0	-27.3	32.0	25.5	22.8	0.23
940407	1600	1.06	0.201	0.210	4.98	4.75	40.0	40.0	22.0	37.9	29.3	21.0	0.14
940407	1900	1.24	0.181	0.181	5.52	5.52	48.0	44.0	39.7	27.5	23.9	15.6	0.15
940407	2200	0.96	0.201	0.191	4.98	5.24	54.0	54.0	37.1	35.8	21.7	19.2	0.21
940408	0100	1.13	0.181	0.191	5.52	5.24	44.0	42.0	33.4	18.4	16.3	12.3	0.22
940408	0400	1.05	0.171	0.171	5.83	5.83	40.0	40.0	33.2	16.1	14.7	12.3	0.20
940408	0700	0.99	0.171	0.171	5.83	5.83	36.0	38.0	29.9	18.9	15.2	7.9	0.12
940408	1000	0.81	0.181	0.181	5.52	5.52	38.0	38.0	28.7	28.8	19.3	11.2	0.10
940408	1300	0.90	0.171	0.171	5.83	5.83	32.0	32.0	28.1	28.3	21.9	16.6	0.12
940408	1600	1.00	0.162	0.162	6.19	6.19	30.0	26.0	26.0	25.7	22.5	13.0	0.14
940408	1900	0.83	0.162	0.162	6.19	6.19	32.0	36.0	25.8	30.8	22.0	12.2	0.13
940408	2200	0.73	0.152	0.152	6.59	6.59	28.0	34.0	19.9	33.9	25.1	16.7	0.11
940409	0100	0.66	0.162	0.162	6.19	6.19	18.0	18.0	12.0	35.4	28.3	18.7	0.11
940409	0400	0.65	0.181	0.171	5.52	5.83	36.0	18.0	11.3	37.1	32.5	26.9	0.15
940409	0700	0.63	0.162	0.113	6.19	8.87	18.0	20.0	8.5	38.9	34.3	28.8	0.16
940409	1000	0.56	0.171	0.113	5.83	8.87	20.0	-10.0	7.0	35.6	31.9	24.9	0.13
940409	1300	0.56	0.103	0.103	9.71	9.71	-18.0	-16.0	-13.8	36.4	36.5	21.5	0.16
940409	1600	0.62	0.308	0.113	3.25	8.87	-56.0	-56.0	-27.9	42.6	28.3	29.2	0.26
940409	1900	0.58	0.103	0.103	9.71	9.71	-24.0	-24.0	-20.8	33.8	29.3	23.6	0.24
940409	2200	0.55	0.113	0.113	8.87	8.87	-8.0	-12.0	-24.0	31.0	27.6	23.5	0.18
940410	0100	0.61	0.103	0.103	9.71	9.71	-12.0	-12.0	-22.4	26.8	23.9	18.3	0.17
940410	0400	0.65	0.103	0.103	9.71	9.71	-12.0	-12.0	-27.0	29.4	23.0	17.0	0.23
940410	0700	0.68	0.103	0.103	9.71	9.71	-14.0	-48.0	-32.2	31.1	21.9	17.7	0.26
940410	1000	0.62	0.103	0.103	9.71	9.71	-10.0	-12.0	-25.4	29.6	19.9	22.8	0.20
940410	1300	0.64	0.103	0.113	9.71	8.87	-22.0	-44.0	-29.9	30.3	17.0	19.8	0.19
940410	1600	0.70	0.181	0.113	5.52	8.87	-40.0	-40.0	-30.5	28.9	15.4	18.8	0.25
940410	1900	0.68	0.171	0.103	5.83	9.71	-44.0	-42.0	-36.9	23.0	16.7	21.8	0.29
940410	2200	0.60	0.103	0.103	9.71	9.71	-16.0	-40.0	-29.2	24.9	17.0	19.2	0.26
940411	0100	0.56	0.123	0.103	8.16	9.71	-20.0	-36.0	-26.2	22.4	18.6	19.7	0.18
940411	0400	0.61	0.142	0.113	7.04	8.87	-38.0	-28.0	-30.4	21.3	22.2	16.8	0.23
940411	0700	1.12	0.210	0.210	4.75	4.75	28.0	24.0	12.6	48.2	28.6	23.0	0.11
940411	1000	1.36	0.201	0.201	4.98	4.98	36.0	34.0	21.3	37.8	33.0	28.1	0.09
940411	1300	1.35	0.181	0.191	5.52	5.24	-2.0	-2.0	9.5	39.8	33.6	34.8	0.09
940411	1600	1.35	0.162	0.162	6.19	6.19	8.0	6.0	9.4	31.7	31.7	15.7	0.11
940411	1900	1.24	0.162	0.171	6.19	5.83	12.0	14.0	24.4	41.8	35.2	20.1	0.15
940411	2200	1.29	0.181	0.181	5.52	5.52	18.0	18.0	20.8	35.2	28.9	20.9	0.15
940412	0100	1.13	0.191	0.191	5.24	5.24	28.0	8.0	13.3	38.3	29.3	25.5	0.10
940412	0400	1.08	0.171	0.171	5.83	5.83	10.0	6.0	10.2	38.8	34.1	30.1	0.10
940412	0700	0.98	0.152	0.152	6.59	6.59	14.0	6.0	10.0	45.1	42.2	31.1	0.13
940412	1000	0.86	0.103	0.162	9.71	6.19	-22.0	-32.0	-5.9	45.3	44.9	44.9	0.15
940412	1300	0.85	0.113	0.113	8.87	8.87	-22.0	-24.0	-11.7	43.2	43.7	28.9	0.14
940412	1600	0.86	0.171	0.142	5.83	7.04	-42.0	-38.0	-22.1	40.1	41.0	29.0	0.15
940412	1900	0.80	0.113	0.113	8.87	8.87	-24.0	-22.0	-22.3	37.1	37.2	22.5	0.18
940412	2200	0.74	0.103	0.103	9.71	9.71	-22.0	-20.0	-23.9	34.0	35.8	24.8	0.17
940413	0100	0.69	0.103	0.113	9.71	8.87	-16.0	-16.0	-25.2	31.9	33.5	30.9	0.15
940413	0400	0.70	0.123	0.113	8.16	8.87	-18.0	-16.0	-24.6	33.1	33.3	28.1	0.15

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940413	0700	0.75	0.181	0.113	5.52	8.87	-26.0	-26.0	-28.1	34.6	31.1	26.0	0.18
940413	1000	0.76	0.162	0.162	6.19	6.19	-44.0	-40.0	-37.6	32.2	28.6	24.0	0.18
940413	1300	0.68	0.152	0.152	6.59	6.59	-38.0	-36.0	-36.2	30.0	23.2	23.9	0.17
940413	1600	0.81	0.152	0.132	6.59	7.56	-36.0	-56.0	-41.4	25.2	14.9	14.3	0.23
940413	1900	0.79	0.132	0.132	7.56	7.56	-40.0	-40.0	-41.0	20.3	15.0	15.0	0.26
940413	2200	0.65	0.132	0.113	7.56	8.87	-38.0	-38.0	-39.4	22.3	18.2	19.9	0.30
940414	0100	0.56	0.132	0.113	7.56	8.87	-38.0	-38.0	-32.2	23.5	20.6	21.8	0.19
940414	0400	0.56	0.123	0.123	8.16	8.16	-38.0	-38.0	-32.6	23.7	21.8	23.0	0.18
940414	0700	0.56	0.123	0.123	8.16	8.16	-38.0	-40.0	-35.3	23.3	21.5	18.1	0.25
940414	1000	0.55	0.123	0.103	8.16	9.71	-38.0	-38.0	-39.9	22.6	19.8	23.6	0.28
940414	1300	0.54	0.113	0.103	8.87	9.71	-36.0	-38.0	-36.9	22.6	21.2	19.9	0.25
940414	1600	0.57	0.113	0.113	8.87	8.87	-38.0	-40.0	-35.9	23.3	21.8	18.8	0.25
940415	1000	0.48	0.132	0.123	7.56	8.16	-38.0	-38.0	-34.1	31.9	26.1	22.2	0.24
940416	0100	0.50	0.142	0.113	7.04	8.87	-38.0	-38.0	-29.4	35.5	24.2	29.7	0.23
940416	0400	0.57	0.142	0.103	7.04	9.71	-38.0	-48.0	-34.5	34.0	20.1	25.9	0.20
940416	0700	0.69	0.162	0.171	6.19	5.83	-44.0	-54.0	-42.5	24.8	16.4	14.8	0.23
940416	1000	0.64	0.142	0.142	7.04	7.04	-40.0	-42.0	-43.2	25.7	18.0	18.4	0.22
940416	1300	0.58	0.142	0.132	7.04	7.56	-40.0	-40.0	-42.0	26.8	21.3	23.1	0.22
940416	1600	0.60	0.142	0.142	7.04	7.04	-40.0	-40.0	-44.5	27.6	23.6	20.7	0.19
940416	1900	0.61	0.132	0.123	7.56	8.16	-40.0	-40.0	-42.7	26.3	22.0	23.9	0.23
940416	2200	0.56	0.113	0.113	8.87	8.87	-38.0	-38.0	-40.2	22.2	22.7	19.3	0.23
940417	0100	0.48	0.132	0.113	7.56	8.87	-38.0	-40.0	-32.3	27.2	29.3	25.0	0.25
940417	0400	0.42	0.123	0.113	8.16	8.87	-36.0	-38.0	-22.2	38.0	31.7	29.3	0.22
940417	0700	0.37	0.113	0.113	8.87	8.87	-34.0	-36.0	-29.4	35.8	31.9	26.1	0.24
940417	1000	0.35	0.123	0.123	8.16	8.16	-42.0	-40.0	-32.5	35.1	30.7	25.8	0.26
940417	1300	0.35	0.132	0.123	7.56	8.16	-38.0	-38.0	-26.2	34.8	29.0	31.1	0.24
940417	1600	0.42	0.132	0.123	7.56	8.16	-42.0	-40.0	-33.0	36.5	24.1	32.4	0.23
940417	1900	0.53	0.250	0.132	4.01	7.56	-60.0	-60.0	-44.6	38.9	18.0	25.0	0.23
940417	2200	0.41	0.132	0.123	7.56	8.16	-38.0	-60.0	-40.0	38.3	17.4	20.8	0.25
940418	0100	0.32	0.142	0.103	7.04	9.71	-40.0	-40.0	-32.3	34.1	25.3	31.1	0.25
940418	0400	0.31	0.113	0.113	8.87	8.87	-18.0	-20.0	-20.3	34.1	29.1	18.5	0.30
940418	0700	0.33	0.123	0.113	8.16	8.87	-20.0	-20.0	-23.7	31.1	26.9	24.8	0.30
940418	1000	0.36	0.123	0.123	8.16	8.16	-20.0	-18.0	-22.3	33.9	30.3	25.4	0.24
940418	1300	0.42	0.123	0.123	8.16	8.16	-18.0	-20.0	-8.0	43.7	27.8	18.6	0.24
940418	1600	0.41	0.113	0.113	8.87	8.87	-12.0	-20.0	-17.9	29.2	27.9	21.9	0.25
940418	1900	0.42	0.132	0.113	7.56	8.87	-24.0	-22.0	-21.5	27.7	25.1	23.0	0.22
940418	2200	0.42	0.162	0.123	6.19	8.16	-6.0	-6.0	-15.6	29.3	28.0	20.5	0.23
940419	0100	0.43	0.152	0.152	6.59	6.59	-4.0	-4.0	-11.4	26.8	24.9	20.2	0.20
940419	0400	0.40	0.113	0.113	8.87	8.87	-18.0	-6.0	-15.3	28.2	25.0	26.8	0.29
940419	0700	0.42	0.083	0.132	11.98	7.56	-10.0	-8.0	-20.2	32.2	23.0	29.3	0.23
940419	1000	0.40	0.083	0.083	11.98	11.98	-8.0	-20.0	-26.7	31.0	21.7	16.8	0.31
940419	1300	0.39	0.083	0.083	11.98	11.98	-8.0	-56.0	-33.5	32.2	19.8	18.7	0.28
940419	1600	0.43	0.259	0.083	3.86	11.98	-56.0	-56.0	-40.3	35.2	13.6	18.9	0.28
940419	1900	0.38	0.083	0.083	11.98	11.98	-8.0	-56.0	-35.1	36.8	15.3	18.8	0.28
940419	2200	0.37	0.289	0.074	3.47	13.56	-58.0	-56.0	-35.3	36.5	15.3	16.3	0.30
940420	0100	0.36	0.269	0.083	3.72	11.98	-58.0	-58.0	-37.2	38.3	12.7	20.3	0.31
940420	0400	0.35	0.152	0.083	6.59	11.98	-42.0	-56.0	-34.6	38.9	14.4	20.8	0.30
940420	1000	0.37	0.152	0.083	6.59	11.98	-44.0	-44.0	-35.4	36.3	21.7	26.2	0.25
940420	1300	0.39	0.083	0.083	11.98	11.98	-8.0	-24.0	-33.2	39.9	31.0	25.5	0.31
940420	1600	0.39	0.083	0.083	11.98	11.98	-8.0	-54.0	-28.6	41.5	30.8	22.9	0.21
940420	1900	0.48	0.083	0.083	11.98	11.98	-22.0	-22.0	-22.4	36.3	29.6	28.1	0.23
940420	2200	0.45	0.083	0.083	11.98	11.98	-18.0	-10.0	-23.6	35.3	27.7	24.2	0.22
940421	0100	0.45	0.083	0.083	11.98	11.98	-6.0	-34.0	-31.3	40.6	30.5	23.9	0.17
940421	0400	0.41	0.083	0.083	11.98	11.98	-24.0	-24.0	-36.1	41.9	41.4	26.8	0.24
940421	0700	0.46	0.093	0.093	10.72	10.72	-14.0	-16.0	-2.0	53.5	40.2	29.5	0.23
940421	1000	0.84	0.250	0.269	4.01	3.72	38.0	38.0	22.4	34.6	23.8	22.0	0.20
940421	1300	0.85	0.210	0.210	4.75	4.75	2.0	2.0	8.3	31.7	24.4	20.0	0.20

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940421	1600	0.67	0.191	0.210	5.24	4.75	-4.0	-2.0	3.3	32.2	26.1	22.9	0.20
940421	1900	0.53	0.201	0.201	4.98	4.98	0.0	-2.0	-0.7	26.4	24.8	14.1	0.16
940421	2200	0.50	0.181	0.181	5.52	5.52	2.0	2.0	-2.4	24.0	24.2	8.6	0.15
940422	0100	0.50	0.191	0.191	5.24	5.24	0.0	0.0	-3.2	26.4	23.8	11.2	0.16
940422	0400	0.48	0.191	0.093	5.24	10.72	14.0	0.0	-1.1	36.4	32.0	31.3	0.18
940422	0700	1.31	0.230	0.230	4.35	4.35	44.0	46.0	40.0	28.3	24.5	22.0	0.21
940422	1000	1.89	0.171	0.171	5.83	5.83	40.0	42.0	38.0	22.4	21.6	17.5	0.15
940422	1300	2.04	0.162	0.152	6.19	6.59	36.0	38.0	36.7	18.3	18.9	14.3	0.20
940422	1600	1.43	0.162	0.162	6.19	6.19	38.0	38.0	26.7	31.8	27.2	30.8	0.17
940422	1900	1.45	0.171	0.162	5.83	6.19	40.0	40.0	27.6	31.8	25.8	21.9	0.13
940422	2200	1.39	0.162	0.171	6.19	5.83	6.0	6.0	16.4	33.4	26.2	23.0	0.11
940423	0100	1.50	0.171	0.171	5.83	5.83	8.0	6.0	10.6	34.1	26.2	24.9	0.11
940423	0400	1.47	0.162	0.162	6.19	6.19	6.0	4.0	13.3	30.2	25.0	17.9	0.11
940423	0700	1.53	0.162	0.162	6.19	6.19	10.0	8.0	12.3	30.2	23.2	17.9	0.11
940423	1000	1.59	0.162	0.162	6.19	6.19	8.0	2.0	11.5	29.0	23.8	20.3	0.10
940423	1300	1.51	0.113	0.152	8.87	6.59	-6.0	2.0	8.6	27.6	24.6	21.7	0.10
940423	1600	1.30	0.123	0.123	8.16	8.16	-4.0	2.0	7.8	31.8	29.4	18.4	0.14
940423	1900	1.13	0.103	0.123	9.71	8.16	-2.0	-2.0	6.7	30.0	29.1	22.7	0.14
940423	2200	1.01	0.113	0.123	8.87	8.16	-4.0	-4.0	4.0	25.1	27.7	17.7	0.10
940424	0100	0.88	0.113	0.113	8.87	8.87	-4.0	-2.0	-5.8	25.0	26.7	12.2	0.13
940424	0400	0.75	0.132	0.132	7.56	7.56	-12.0	-6.0	-11.0	27.4	27.4	22.2	0.22
940424	0700	0.59	0.113	0.113	8.87	8.87	0.0	0.0	-4.8	30.0	29.8	18.4	0.22
940424	1000	0.51	0.123	0.123	8.16	8.16	-8.0	-6.0	-10.8	27.8	26.8	19.2	0.15
940424	1300	0.48	0.132	0.132	7.56	7.56	-2.0	-14.0	-18.6	30.6	28.8	23.9	0.19
940424	1600	0.54	0.259	0.123	3.86	8.16	-60.0	-60.0	-35.6	42.9	22.9	24.7	0.29
940424	1900	0.53	0.259	0.123	3.86	8.16	-58.0	-58.0	-38.1	39.3	17.0	25.6	0.31
940424	2200	0.38	0.123	0.132	8.16	7.56	-16.0	-40.0	-25.3	31.3	20.3	20.5	0.27
940425	0100	0.35	0.142	0.074	7.04	13.56	-36.0	-38.0	-28.0	31.6	21.6	28.4	0.33
940425	0400	0.34	0.074	0.074	13.56	13.56	0.0	-40.0	-23.0	33.0	20.8	26.6	0.48
940425	0700	0.30	0.074	0.074	13.56	13.56	-12.0	-10.0	-22.7	31.1	23.1	24.2	0.38
940425	1000	0.31	0.074	0.074	13.56	13.56	-4.0	-12.0	-21.7	31.1	25.2	22.3	0.40
940425	1300	0.35	0.064	0.074	15.63	13.56	-12.0	-14.0	-17.4	31.2	27.8	25.7	0.37
940425	1600	0.35	0.074	0.074	13.56	13.56	-12.0	-36.0	-24.2	34.0	27.7	30.8	0.44
940425	1900	0.37	0.074	0.074	13.56	13.56	-14.0	-26.0	-26.5	31.1	25.1	29.0	0.43
940425	2200	0.36	0.074	0.074	13.56	13.56	-14.0	-24.0	-27.6	31.8	24.6	25.5	0.43
940426	0100	0.36	0.123	0.074	8.16	13.56	-36.0	-36.0	-26.0	31.0	24.2	26.4	0.51
940426	0400	0.37	0.074	0.074	13.56	13.56	4.0	-38.0	-21.3	35.4	28.0	27.4	0.34
940426	1000	0.32	0.074	0.074	13.56	13.56	4.0	-26.0	-19.6	37.5	29.6	24.8	0.54
940426	1300	0.34	0.074	0.083	13.56	11.98	-6.0	-22.0	-22.4	37.6	27.3	30.5	0.44
940426	1600	0.33	0.083	0.083	11.98	11.98	-4.0	-38.0	-22.3	36.8	28.8	33.0	0.46
940426	1900	0.38	0.250	0.083	4.01	11.98	-90.0	-38.0	-37.1	47.5	37.6	34.3	0.41
940426	2200	0.37	0.074	0.083	13.56	11.98	2.0	-90.0	-24.1	54.2	36.7	29.1	0.41
940427	0100	0.36	0.083	0.083	11.98	11.98	-4.0	-18.0	-16.8	46.8	36.2	25.0	0.25
940427	0400	0.36	0.083	0.083	11.98	11.98	-24.0	-16.0	-21.0	45.2	38.5	28.5	0.32
940427	0700	0.36	0.083	0.083	11.98	11.98	-6.0	-42.0	-32.0	45.5	34.8	27.9	0.24
940427	1000	0.33	0.083	0.083	11.98	11.98	-4.0	-40.0	-32.5	45.7	33.3	27.9	0.29
940427	1300	0.36	0.240	0.083	4.17	11.98	-52.0	-56.0	-34.8	48.0	27.2	32.1	0.25
940427	1600	0.38	0.318	0.083	3.15	11.98	-58.0	-58.0	-26.0	49.5	23.9	26.3	0.34
940427	1900	0.30	0.064	0.083	15.63	11.98	-10.0	-40.0	-25.6	44.6	31.5	32.1	0.31
940427	2200	0.28	0.064	0.083	15.63	11.98	-10.0	-12.0	-27.0	38.9	28.5	28.0	0.35
940428	0100	0.27	0.064	0.083	15.63	11.98	-24.0	-32.0	-28.3	34.0	28.6	30.1	0.35
940428	0400	0.28	0.093	0.083	10.72	11.98	-24.0	-36.0	-26.0	33.0	28.4	29.0	0.37
940428	0700	0.29	0.074	0.083	13.56	11.98	-14.0	-38.0	-28.4	34.6	27.3	28.4	0.40
940428	1000	0.30	0.142	0.083	7.04	11.98	-40.0	-40.0	-26.7	38.5	31.5	27.8	0.31
940428	1300	0.32	0.064	0.064	15.63	15.63	8.0	-18.0	-26.1	40.4	25.9	25.0	0.32
940428	1600	0.33	0.074	0.064	13.56	15.63	-12.0	-12.0	-22.8	34.7	30.5	19.1	0.40
940428	1900	0.37	0.074	0.074	13.56	13.56	-10.0	-26.0	-4.5	46.5	40.2	29.6	0.33
940428	2200	0.46	0.064	0.064	15.63	15.63	-12.0	-14.0	9.6	59.6	26.0	27.6	0.28

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940429	0100	0.50	0.230	0.064	4.35	15.63	32.0	32.0	6.6	50.1	24.7	30.0	0.29
940429	0400	0.49	0.064	0.064	15.63	15.63	-8.0	-12.0	0.5	46.8	28.5	25.7	0.24
940429	0700	0.48	0.074	0.074	13.56	13.56	-10.0	-2.0	2.3	43.3	27.8	23.2	0.27
940429	1000	0.46	0.064	0.074	15.63	13.56	-4.0	-2.0	-4.0	37.2	29.1	28.4	0.29
940429	1300	0.46	0.064	0.074	15.63	13.56	-4.0	-4.0	-3.7	34.9	28.3	30.0	0.36
940429	1600	0.50	0.074	0.074	13.56	13.56	0.0	-8.0	-14.2	37.3	36.7	26.1	0.25
940429	1900	0.50	0.074	0.074	13.56	13.56	4.0	4.0	-15.2	39.2	37.2	27.4	0.29
940429	2200	0.53	0.074	0.074	13.56	13.56	4.0	22.0	2.9	40.1	34.8	28.4	0.34
940430	0100	0.52	0.074	0.074	13.56	13.56	8.0	8.0	-0.2	37.4	35.2	30.1	0.38
940430	0400	0.53	0.074	0.074	13.56	13.56	-12.0	6.0	-2.6	35.4	34.4	28.4	0.22
940430	0700	0.55	0.074	0.074	13.56	13.56	0.0	14.0	-4.7	39.6	38.3	23.7	0.33
940430	1000	0.52	0.074	0.074	13.56	13.56	4.0	6.0	-5.5	41.9	41.9	23.9	0.29
940430	1300	0.47	0.074	0.074	13.56	13.56	6.0	8.0	-20.5	45.1	39.2	27.5	0.32
940430	1600	0.53	0.318	0.074	3.15	13.56	-56.0	-56.0	-31.6	43.4	26.2	25.5	0.24
940430	1900	0.55	0.132	0.074	7.56	13.56	-38.0	-38.0	-31.3	42.3	23.9	21.9	0.23
940430	2200	0.51	0.132	0.132	7.56	7.56	-40.0	-40.0	-33.3	38.1	22.8	21.6	0.22
940501	0100	0.45	0.132	0.132	7.56	7.56	-38.0	-38.0	-33.1	38.8	21.1	19.7	0.28
940501	0400	0.44	0.132	0.132	7.56	7.56	-36.0	-38.0	-34.4	30.3	20.1	16.6	0.26
940501	0700	0.52	0.162	0.142	6.19	7.04	-40.0	-38.0	-35.4	24.6	18.3	22.9	0.20
940501	1000	0.48	0.171	0.162	5.83	6.19	-38.0	-38.0	-37.4	22.1	18.2	14.8	0.23
940501	1300	0.47	0.171	0.152	5.83	6.59	-44.0	-42.0	-41.3	23.9	18.5	17.3	0.23
940501	1600	0.49	0.142	0.142	7.04	7.04	-38.0	-40.0	-41.5	25.3	17.4	17.9	0.24
940501	1900	0.44	0.142	0.142	7.04	7.04	-38.0	-38.0	-39.1	23.1	16.7	12.3	0.22
940501	2200	0.51	0.142	0.142	7.04	7.04	-40.0	-40.0	-20.3	49.5	35.8	11.9	0.21
940502	0100	1.53	0.191	0.191	5.24	5.24	36.0	34.0	36.9	24.0	23.5	13.5	0.17
940502	0400	2.09	0.162	0.162	6.19	6.19	28.0	28.0	35.4	20.1	19.1	13.5	0.17
940502	0700	2.30	0.132	0.152	7.56	6.59	14.0	16.0	32.2	23.0	20.6	14.7	9.99
940502	1000	1.75	0.142	0.142	7.04	7.04	22.0	22.0	35.3	25.5	22.6	11.9	0.18
940502	1300	1.33	0.142	0.142	7.04	7.04	22.0	40.0	37.7	27.3	25.0	15.8	0.18
940502	1600	1.03	0.142	0.142	7.04	7.04	30.0	34.0	28.9	28.1	25.0	20.6	0.16
940502	1900	0.85	0.142	0.142	7.04	7.04	24.0	36.0	22.8	32.4	25.3	23.9	0.16
940502	2200	0.84	0.162	0.162	6.19	6.19	24.0	24.0	15.8	41.3	28.9	20.1	0.16
940503	0100	0.95	0.171	0.171	5.83	5.83	28.0	26.0	17.3	36.8	29.7	31.3	0.12
940503	0400	1.09	0.230	0.201	4.35	4.98	28.0	6.0	16.0	36.7	31.2	30.5	0.11
940503	0700	1.21	0.201	0.201	4.98	4.98	8.0	6.0	15.1	36.0	28.4	21.6	0.10
940503	1000	1.29	0.181	0.181	5.52	5.52	8.0	4.0	12.0	33.7	26.0	19.3	0.10
940503	1300	1.41	0.181	0.181	5.52	5.52	4.0	6.0	14.8	34.4	25.4	16.1	0.12
940503	1600	1.56	0.162	0.162	6.19	6.19	-2.0	0.0	10.0	32.7	25.0	15.7	0.12
940503	1900	1.70	0.162	0.162	6.19	6.19	4.0	4.0	6.5	26.5	24.9	15.9	0.11
940503	2200	2.03	0.142	0.142	7.04	7.04	4.0	4.0	-1.3	33.2	36.3	24.3	0.13
940504	0100	2.23	0.132	0.132	7.56	7.56	-2.0	0.0	-5.0	32.8	35.3	24.5	0.14
940504	0400	2.55	0.123	0.123	8.16	8.16	-16.0	-16.0	-9.1	32.5	32.9	26.9	0.14
940504	0700	2.96	0.113	0.113	8.87	8.87	-6.0	-12.0	8.5	37.8	36.4	27.8	0.13
940504	1000	3.56	0.113	0.113	8.87	8.87	-16.0	-12.0	-1.3	32.9	30.8	26.2	0.14
940504	1300	3.23	0.103	0.103	9.71	9.71	-6.0	-8.0	7.0	30.9	30.3	23.5	0.14
940504	1600	2.55	0.103	0.103	9.71	9.71	12.0	12.0	18.6	27.8	24.9	21.2	0.15
940504	1900	2.36	0.093	0.103	10.72	9.71	8.0	42.0	20.9	30.8	20.4	20.9	0.19
940504	2200	2.15	0.113	0.113	8.87	8.87	12.0	16.0	22.1	28.5	20.7	24.9	0.18
940505	0100	2.14	0.093	0.093	10.72	10.72	12.0	12.0	19.3	25.4	20.8	13.4	0.18
940505	0400	2.04	0.083	0.083	11.98	11.98	12.0	12.0	21.5	24.8	20.8	15.6	0.18
940505	0700	1.87	0.083	0.093	11.98	10.72	8.0	10.0	18.0	23.3	21.0	18.1	0.15
940505	1000	1.65	0.132	0.132	7.56	7.56	12.0	10.0	15.4	21.0	19.7	15.8	0.13
940505	1300	1.59	0.083	0.113	11.98	8.87	4.0	10.0	14.7	24.0	22.6	29.7	0.17
940505	1600	1.44	0.083	0.113	11.98	8.87	8.0	10.0	13.5	25.9	24.1	28.3	0.21
940505	1900	1.45	0.093	0.113	10.72	8.87	6.0	8.0	8.8	24.5	24.4	25.3	0.17
940505	2200	1.27	0.093	0.113	10.72	8.87	10.0	8.0	9.7	25.1	25.4	23.5	0.12
940506	0100	1.22	0.083	0.083	11.98	11.98	8.0	10.0	10.5	24.7	25.3	19.2	0.18
940506	0400	1.08	0.083	0.083	11.98	11.98	6.0	8.0	9.0	27.1	26.6	23.1	0.21

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940506	0700	1.11	0.083	0.083	11.98	11.98	4.0	4.0	2.3	24.1	24.1	21.3	0.21
940506	1000	0.94	0.093	0.093	10.72	10.72	-2.0	-2.0	-0.8	25.4	25.9	20.0	0.15
940506	1300	0.86	0.093	0.093	10.72	10.72	0.0	0.0	-4.6	23.7	25.0	18.8	0.22
940506	1600	0.69	0.093	0.093	10.72	10.72	8.0	6.0	-3.7	28.2	28.5	21.9	0.30
940506	1900	0.64	0.093	0.093	10.72	10.72	0.0	0.0	-8.5	29.8	27.3	20.4	0.34
940506	2200	0.61	0.083	0.083	11.98	11.98	2.0	2.0	-5.2	30.5	27.3	24.5	0.21
940507	0100	0.58	0.103	0.103	9.71	9.71	-10.0	-14.0	-14.3	29.4	27.3	21.8	0.26
940507	0400	0.56	0.103	0.103	9.71	9.71	6.0	2.0	-9.5	31.7	28.1	21.7	0.27
940507	0700	0.51	0.093	0.083	10.72	11.98	8.0	6.0	-18.1	34.6	29.7	28.6	0.25
940507	1000	0.50	0.103	0.103	9.71	9.71	0.0	0.0	-13.3	32.3	28.4	23.9	0.22
940507	1300	0.49	0.103	0.083	9.71	11.98	10.0	-14.0	-8.1	33.6	29.1	28.9	0.24
940507	1600	0.49	0.103	0.083	9.71	11.98	-8.0	-14.0	-21.2	35.9	24.4	31.1	0.27
940507	1900	0.45	0.093	0.083	10.72	11.98	-10.0	-14.0	-16.2	31.5	26.9	30.6	0.27
940507	2200	0.42	0.083	0.083	11.98	11.98	-22.0	-22.0	-31.8	32.2	26.5	25.5	0.27
940508	0100	0.41	0.083	0.083	11.98	11.98	-8.0	-34.0	-22.5	32.9	26.2	29.6	0.26
940508	0400	0.47	0.132	0.123	7.56	8.16	-40.0	-38.0	-37.0	26.5	20.8	19.4	0.27
940508	0700	0.47	0.132	0.123	7.56	8.16	-40.0	-38.0	-35.5	26.9	19.4	21.0	0.22
940508	1000	0.42	0.132	0.113	7.56	8.87	-38.0	-38.0	-34.7	26.3	21.8	19.3	0.22
940508	1300	0.47	0.132	0.113	7.56	8.87	-38.0	-38.0	-37.0	26.6	25.0	23.8	0.24
940508	1600	0.49	0.123	0.113	8.16	8.87	-40.0	-40.0	-33.0	27.8	25.7	21.0	0.24
940508	1900	0.46	0.132	0.113	7.56	8.87	-44.0	-44.0	-34.0	31.4	29.3	23.6	0.19
940508	2200	0.48	0.318	0.123	3.15	8.16	62.0	62.0	8.7	89.4	26.0	20.3	0.28
940509	0100	0.47	0.230	0.123	4.35	8.16	60.0	62.0	8.9	85.9	21.7	22.0	0.21
940509	0400	0.41	0.113	0.113	8.87	8.87	-26.0	52.0	5.6	79.5	23.4	18.5	0.21
940509	0700	0.37	0.123	0.113	8.16	8.87	-40.0	-38.0	-10.3	63.2	25.4	24.1	0.24
940509	1000	0.36	0.123	0.113	8.16	8.87	-22.0	-22.0	-22.3	33.1	26.2	25.3	0.24
940509	1300	0.41	0.132	0.123	7.56	8.16	-38.0	-36.0	-26.2	27.2	24.6	21.1	0.21
940509	1600	0.40	0.132	0.113	7.56	8.87	-38.0	-38.0	-30.1	26.7	25.9	20.5	0.22
940509	1900	0.40	0.113	0.113	8.87	8.87	-16.0	-20.0	-25.4	25.6	26.1	16.3	0.20
940509	2200	0.41	0.123	0.123	8.16	8.16	-18.0	-16.0	-25.3	25.0	25.0	16.3	0.24
940510	0100	0.45	0.123	0.113	8.16	8.87	-18.0	-36.0	-28.0	26.4	25.4	22.9	0.19
940510	0400	0.48	0.123	0.113	8.16	8.87	-32.0	-36.0	-31.6	26.3	25.3	21.7	0.21
940510	0700	0.49	0.113	0.113	8.87	8.87	-36.0	-36.0	-35.9	26.3	25.7	27.7	0.22
940510	1000	0.45	0.123	0.113	8.16	8.87	-20.0	-36.0	-27.8	25.6	24.0	21.1	0.24
940510	1300	0.46	0.123	0.113	8.16	8.87	-20.0	-36.0	-27.9	25.2	22.7	22.8	0.20
940510	1600	0.47	0.142	0.123	7.04	8.16	-36.0	-38.0	-25.8	29.3	25.6	20.5	0.24
940510	1900	0.54	0.132	0.113	7.56	8.87	-24.0	-24.0	-8.2	45.6	21.1	25.9	0.28
940510	2200	0.52	0.113	0.113	8.87	8.87	-18.0	-20.0	-20.3	30.1	24.0	26.6	0.26
940511	0100	0.56	0.113	0.123	8.87	8.16	-22.0	-22.0	-17.2	31.0	24.4	24.8	0.16
940511	0400	0.56	0.132	0.123	7.56	8.16	-34.0	-34.0	-17.7	33.5	27.1	22.9	0.21
940511	0700	0.55	0.123	0.123	8.16	8.16	-16.0	-16.0	-14.1	30.0	26.8	25.0	0.21
940511	1000	0.57	0.123	0.123	8.16	8.16	-18.0	-14.0	-12.4	26.8	26.0	20.7	0.22
940511	1300	0.58	0.132	0.132	7.56	7.56	-16.0	-14.0	-18.6	28.6	27.8	23.2	0.15
940511	1600	0.63	0.142	0.142	7.04	7.04	-36.0	-36.0	-24.5	26.3	26.4	23.4	0.19
940511	1900	0.62	0.152	0.132	6.59	7.56	-38.0	-36.0	-31.9	29.2	28.5	23.0	0.19
940511	2200	0.60	0.132	0.132	7.56	7.56	-16.0	-16.0	-24.5	25.2	26.2	16.6	0.21
940512	0100	0.58	0.123	0.123	8.16	8.16	-34.0	-12.0	-29.8	28.4	26.4	26.6	0.14
940512	0400	0.62	0.123	0.123	8.16	8.16	-12.0	-12.0	-28.7	31.1	25.6	23.7	0.18
940512	0700	0.59	0.123	0.123	8.16	8.16	-36.0	-38.0	-35.3	32.1	24.5	25.2	0.21
940512	1000	0.55	0.123	0.123	8.16	8.16	-34.0	-36.0	-33.3	32.1	24.1	25.1	0.22
940512	1300	0.54	0.123	0.123	8.16	8.16	-14.0	-36.0	-33.0	30.7	22.8	22.9	0.18
940512	1600	0.56	0.132	0.132	7.56	7.56	-18.0	-36.0	-29.1	28.1	22.3	21.6	0.19
940512	1900	0.77	0.269	0.269	3.72	3.72	62.0	-38.0	18.1	88.4	30.3	14.7	0.29
940512	2200	1.60	0.191	0.191	5.24	5.24	48.0	50.0	45.0	19.5	18.4	13.5	0.21
940513	0100	1.62	0.162	0.162	6.19	6.19	26.0	40.0	38.7	20.4	17.1	13.9	0.20
940513	0400	1.31	0.171	0.171	5.83	5.83	36.0	36.0	36.8	22.3	18.3	12.4	0.20
940513	0700	1.35	0.171	0.171	5.83	5.83	26.0	56.0	36.0	32.6	21.6	18.2	0.21
940513	1000	1.17	0.171	0.171	5.83	5.83	38.0	38.0	34.8	29.4	20.2	14.1	0.19

(Sheet 32 of 35)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940513	1300	1.03	0.162	0.171	6.19	5.83	24.0	42.0	30.5	31.3	18.5	13.9	0.18
940513	1600	0.88	0.171	0.113	5.83	8.87	28.0	30.0	24.9	45.9	22.3	23.1	0.16
940513	1900	0.79	0.181	0.113	5.52	8.87	30.0	30.0	19.2	46.3	25.9	25.8	0.17
940513	2200	0.62	0.113	0.113	8.87	8.87	-18.0	-14.0	11.8	49.7	31.0	21.6	0.21
940514	0100	0.53	0.103	0.103	9.71	9.71	-16.0	-12.0	6.7	42.7	33.2	18.9	0.17
940514	0400	0.50	0.103	0.113	9.71	8.87	-22.0	-20.0	-3.2	34.8	32.5	24.4	0.16
940514	0700	0.50	0.113	0.113	8.87	8.87	-16.0	-34.0	-10.5	33.6	33.7	24.3	0.22
940514	1000	0.51	0.103	0.113	9.71	8.87	-28.0	-28.0	-18.2	28.7	28.7	24.0	0.24
940514	1300	0.49	0.113	0.113	8.87	8.87	-30.0	-16.0	-18.5	28.1	29.4	22.5	0.22
940514	1600	0.48	0.103	0.103	9.71	9.71	-18.0	-16.0	-16.6	25.3	29.2	22.3	0.23
940514	1900	0.51	0.103	0.103	9.71	9.71	-34.0	-32.0	-16.4	30.6	35.2	24.9	0.18
940514	2200	0.46	0.103	0.103	9.71	9.71	-26.0	-26.0	-24.7	31.0	33.3	26.2	0.22
940515	0100	0.41	0.103	0.103	9.71	9.71	-22.0	-26.0	-14.3	33.5	31.5	20.4	0.27
940515	0400	0.41	0.113	0.113	8.87	8.87	-24.0	-24.0	-19.2	30.4	27.3	16.5	0.25
940515	0700	0.40	0.113	0.113	8.87	8.87	-22.0	-24.0	-23.8	26.5	25.3	15.7	0.28
940515	1000	0.42	0.103	0.103	9.71	9.71	-32.0	-26.0	-29.6	25.6	23.8	24.2	0.25
940515	1300	0.51	0.103	0.103	9.71	9.71	-18.0	-54.0	-37.4	33.8	16.3	19.9	0.24
940515	1600	0.53	0.113	0.103	8.87	9.71	-20.0	-52.0	-36.5	31.2	14.5	17.2	0.23
940515	1900	0.51	0.103	0.103	9.71	9.71	-18.0	-56.0	-36.5	29.4	14.8	19.1	0.28
940515	2200	0.42	0.103	0.103	9.71	9.71	-26.0	-38.0	-33.9	27.9	18.8	23.2	0.27
940516	0100	0.38	0.103	0.103	9.71	9.71	-18.0	-36.0	-28.9	25.2	19.0	19.5	0.29
940516	0400	0.38	0.103	0.103	9.71	9.71	-20.0	-36.0	-31.9	25.1	20.2	16.8	0.30
940516	0700	0.40	0.103	0.103	9.71	9.71	-22.0	-38.0	-35.4	25.0	20.4	21.9	0.25
940516	1000	0.41	0.142	0.103	7.04	9.71	-42.0	-42.0	-36.7	27.0	21.1	23.9	0.26
940516	1300	0.40	0.103	0.103	9.71	9.71	-28.0	-42.0	-35.6	25.1	18.8	15.0	0.22
940516	1600	0.39	0.142	0.103	7.04	9.71	-44.0	-24.0	-32.8	24.9	20.8	21.8	0.25
940516	1900	0.41	0.113	0.113	8.87	8.87	-22.0	-24.0	-33.3	24.2	19.1	15.0	0.26
940516	2200	0.53	0.289	0.308	3.47	3.25	70.0	68.0	19.8	99.6	25.3	11.9	0.32
940517	0100	1.11	0.220	0.220	4.54	4.54	52.0	54.0	43.9	23.2	22.2	16.6	0.18
940517	0400	0.96	0.210	0.201	4.75	4.98	52.0	54.0	47.1	26.5	23.4	20.6	0.21
940517	0700	1.28	0.210	0.201	4.75	4.98	50.0	50.0	43.1	19.7	17.0	13.3	0.22
940517	1000	1.75	0.171	0.171	5.83	5.83	36.0	38.0	41.9	18.8	17.2	14.3	0.26
940517	1300	1.50	0.171	0.171	5.83	5.83	34.0	46.0	39.0	17.1	13.8	9.1	0.24
940517	1600	1.16	0.181	0.181	5.52	5.52	36.0	34.0	37.2	17.8	15.4	10.1	0.20
940517	1900	0.87	0.162	0.181	6.19	5.52	24.0	34.0	33.4	18.5	14.6	9.8	0.14
940517	2200	1.13	0.201	0.201	4.98	4.98	48.0	48.0	43.6	19.7	16.9	13.2	0.25
940518	0100	1.13	0.162	0.171	6.19	5.83	38.0	40.0	42.8	18.3	16.9	11.2	0.23
940518	0400	0.98	0.171	0.181	5.83	5.52	38.0	40.0	39.1	17.6	14.4	12.3	0.16
940518	0700	1.16	0.171	0.171	5.83	5.83	28.0	38.0	35.2	17.5	15.6	11.9	0.17
940518	1000	1.01	0.171	0.181	5.83	5.52	20.0	20.0	30.0	20.7	16.8	14.6	0.18
940518	1600	1.16	0.103	0.103	9.71	9.71	10.0	10.0	15.5	24.1	20.4	20.3	0.14
940518	1900	1.24	0.113	0.103	8.87	9.71	6.0	8.0	12.3	22.2	19.6	19.6	0.13
940518	2200	1.18	0.103	0.103	9.71	9.71	2.0	6.0	11.4	23.7	21.6	19.3	0.18
940519	0100	1.11	0.103	0.103	9.71	9.71	8.0	12.0	23.0	30.9	21.1	14.0	0.22
940519	0400	1.23	0.210	0.220	4.75	4.54	38.0	34.0	24.8	30.4	19.5	15.8	0.18
940519	0700	1.36	0.132	0.220	7.56	4.54	10.0	14.0	28.1	32.1	22.9	21.8	0.15
940519	1000	1.66	0.171	0.191	5.83	5.24	14.0	12.0	19.0	27.8	21.2	19.0	0.16
940519	1300	1.91	0.103	0.103	9.71	9.71	2.0	6.0	20.1	28.8	21.1	15.9	0.16
940519	1600	1.96	0.162	0.142	6.19	7.04	14.0	12.0	22.1	26.5	20.7	18.2	0.16
940519	1900	1.87	0.103	0.132	9.71	7.56	0.0	14.0	18.7	24.8	20.3	14.4	0.13
940519	2200	2.07	0.152	0.142	6.59	7.04	18.0	14.0	20.1	25.1	20.6	16.3	0.15
940520	0100	1.95	0.113	0.113	8.87	8.87	4.0	14.0	23.3	29.0	20.9	13.9	0.19
940520	0400	1.92	0.103	0.103	9.71	9.71	2.0	14.0	20.7	27.8	20.7	15.8	0.17
940520	0700	2.03	0.103	0.103	9.71	9.71	6.0	14.0	21.9	25.3	20.8	14.0	0.16
940520	1000	2.13	0.152	0.152	6.59	6.59	18.0	16.0	24.4	27.2	22.6	17.1	0.17
940520	1300	2.28	0.152	0.152	6.59	6.59	14.0	14.0	22.9	27.8	21.8	18.2	0.18
940520	1600	2.03	0.103	0.103	9.71	9.71	4.0	12.0	24.5	33.4	22.4	17.1	0.20
940520	1900	1.91	0.103	0.103	9.71	9.71	-2.0	14.0	21.5	31.8	22.6	17.9	0.17

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940520	2200	2.03	0.103	0.103	9.71	9.71	0.0	10.0	18.3	30.0	23.2	17.4	0.16
940521	0100	2.13	0.093	0.093	10.72	10.72	6.0	10.0	18.6	31.5	23.9	18.4	0.19
940521	0400	2.14	0.093	0.103	10.72	9.71	-4.0	12.0	20.6	33.2	22.5	18.1	0.19
940521	0700	2.26	0.162	0.152	6.19	6.59	18.0	14.0	21.6	32.1	22.3	18.0	0.18
940521	1000	2.33	0.162	0.162	6.19	6.19	20.0	16.0	23.1	30.7	23.2	14.4	0.19
940521	1300	2.10	0.152	0.152	6.59	6.59	12.0	12.0	23.4	32.9	24.3	18.1	0.22
940521	1600	1.88	0.123	0.103	8.16	9.71	8.0	14.0	23.0	30.3	23.2	21.1	0.20
940521	1900	1.67	0.103	0.103	9.71	9.71	10.0	10.0	20.5	30.7	24.0	19.7	0.18
940521	2200	1.58	0.103	0.103	9.71	9.71	6.0	8.0	16.0	31.3	25.0	19.4	0.15
940522	0100	1.66	0.093	0.093	10.72	10.72	12.0	10.0	16.4	34.2	25.4	21.5	0.18
940522	0400	1.68	0.093	0.093	10.72	10.72	8.0	10.0	19.1	38.8	24.0	20.3	0.20
940522	0700	1.72	0.210	0.123	4.75	8.16	46.0	8.0	21.4	39.5	23.3	26.0	0.19
940522	1000	1.64	0.152	0.113	6.59	8.87	2.0	4.0	14.7	31.7	23.5	21.1	0.15
940522	1300	1.47	0.113	0.123	8.87	8.16	0.0	2.0	11.7	30.1	27.0	26.3	0.16
940522	1600	1.40	0.113	0.113	8.87	8.87	8.0	8.0	11.1	28.7	26.4	25.4	0.17
940522	1900	1.30	0.113	0.113	8.87	8.87	-2.0	6.0	7.9	30.2	26.2	28.4	0.15
940522	2200	1.27	0.113	0.113	8.87	8.87	2.0	2.0	7.7	27.5	25.7	23.1	0.11
940523	0100	1.22	0.113	0.113	8.87	8.87	2.0	2.0	5.4	25.2	24.5	19.3	0.12
940523	0400	1.14	0.113	0.113	8.87	8.87	6.0	6.0	10.4	23.2	23.1	18.4	0.16
940523	0700	1.00	0.113	0.113	8.87	8.87	4.0	4.0	8.9	23.7	22.1	20.5	0.17
940523	1000	0.85	0.103	0.113	9.71	8.87	4.0	12.0	9.8	23.3	22.0	28.3	0.14
940523	1300	0.93	0.103	0.103	9.71	9.71	4.0	10.0	8.5	21.8	22.3	16.3	0.15
940523	1600	0.92	0.132	0.113	7.56	8.87	12.0	14.0	12.2	20.5	19.6	36.9	0.18
940523	1900	0.81	0.103	0.103	9.71	9.71	0.0	16.0	11.4	24.8	20.6	16.0	0.18
940523	2200	0.77	0.113	0.113	8.87	8.87	-2.0	10.0	9.3	23.4	20.2	20.2	0.14
940524	0100	0.70	0.113	0.113	8.87	8.87	4.0	10.0	5.0	30.9	30.1	23.9	0.15
940524	0400	0.68	0.132	0.113	7.56	8.87	2.0	6.0	-1.7	36.8	38.7	34.0	0.19
940524	1300	0.53	0.123	0.113	8.16	8.87	-36.0	4.0	-17.7	37.7	38.7	34.0	0.18
940524	1600	0.48	0.113	0.123	8.87	8.16	0.0	4.0	-8.3	40.0	43.6	35.2	0.21
940524	1900	0.43	0.113	0.113	8.87	8.87	8.0	4.0	-13.1	38.7	41.8	31.3	0.23
940524	2200	0.39	0.123	0.113	8.16	8.87	4.0	-14.0	-8.0	34.4	36.3	31.1	0.26
940525	0100	0.39	0.123	0.123	8.16	8.16	6.0	6.0	-9.8	35.6	34.1	35.3	0.23
940525	0400	0.41	0.123	0.123	8.16	8.16	6.0	6.0	-9.3	35.2	35.1	34.7	0.27
940525	0700	0.37	0.123	0.123	8.16	8.16	-34.0	8.0	-17.2	37.1	36.2	36.0	0.25
940525	1000	0.34	0.113	0.123	8.87	8.16	2.0	4.0	-17.7	37.7	35.8	32.8	0.26
940525	1300	0.39	0.123	0.123	8.16	8.16	-34.0	-34.0	-31.0	38.8	29.8	32.5	0.22
940525	1600	0.46	0.308	0.113	3.25	8.87	-58.0	-56.0	-44.3	32.4	22.0	35.8	0.27
940525	1900	0.44	0.171	0.113	5.83	8.87	-50.0	-56.0	-46.3	30.6	20.6	36.2	0.26
940525	2200	0.35	0.123	0.123	8.16	8.16	-38.0	-58.0	-44.2	33.4	23.8	23.8	0.26
940526	0100	0.37	0.132	0.142	7.56	7.04	-40.0	-38.0	-40.6	25.2	21.1	18.1	0.21
940526	0400	0.43	0.142	0.132	7.04	7.56	-42.0	-42.0	-41.4	24.3	18.7	15.8	0.23
940526	0700	0.43	0.132	0.123	7.56	8.16	-42.0	-42.0	-46.7	29.9	21.1	22.5	0.21
940526	1000	0.41	0.132	0.132	7.56	7.56	-40.0	-42.0	-43.7	27.3	24.8	16.5	0.18
940526	1300	0.44	0.123	0.123	8.16	8.16	-38.0	-40.0	-39.8	27.7	24.8	16.4	0.19
940526	1600	0.58	0.269	0.259	3.72	3.86	-54.0	-52.0	-45.6	24.0	16.2	8.0	0.24
940526	1900	0.64	0.240	0.240	4.17	4.17	-54.0	-56.0	-49.7	15.2	9.2	5.5	0.25
940526	2200	0.44	0.142	0.142	7.04	7.04	-44.0	-44.0	-45.5	24.8	13.8	12.0	0.20
940527	0100	0.38	0.142	0.142	7.04	7.04	-40.0	-40.0	-40.0	20.2	20.0	11.1	0.19
940527	0400	0.40	0.142	0.113	7.04	8.87	-40.0	-40.0	-38.1	21.5	21.4	19.2	0.20
940527	0700	0.47	0.142	0.132	7.04	7.56	-40.0	-40.0	0.4	94.9	24.5	13.0	0.23
940527	1000	1.16	0.191	0.201	5.24	4.98	54.0	54.0	48.1	21.3	19.8	15.8	0.17
940527	1300	1.05	0.191	0.191	5.24	5.24	46.0	38.0	42.8	20.1	17.7	11.1	0.16
940527	1600	0.95	0.191	0.210	5.24	4.75	44.0	48.0	36.1	27.2	18.5	13.6	0.16
940527	1900	0.97	0.171	0.250	5.83	4.01	36.0	38.0	40.8	30.5	25.1	23.2	0.18
940527	2200	0.82	0.162	0.181	6.19	5.52	34.0	32.0	34.5	32.0	28.2	17.3	0.20
940528	0100	0.67	0.152	0.201	6.59	4.98	28.0	34.0	29.0	39.9	29.2	22.1	0.13
940528	0400	0.60	0.162	0.162	6.19	6.19	26.0	26.0	31.0	45.1	30.5	10.3	0.13

Table A1 (Concluded)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
940528	0700	0.55	0.171	0.171	5.83	5.83	26.0	26.0	26.0	46.0	34.3	7.9	0.15
940528	1000	0.50	0.171	0.191	5.83	5.24	26.0	30.0	18.6	54.9	32.1	19.9	0.16
940528	1300	0.47	0.191	0.191	5.24	5.24	30.0	32.0	14.5	54.9	28.4	9.1	0.19
940528	1600	0.47	0.191	0.132	5.24	7.56	32.0	32.0	9.7	53.5	33.8	25.6	0.15
940528	1900	0.46	0.142	0.142	7.04	7.04	-38.0	-14.0	-1.5	39.7	37.4	28.4	0.15
940528	2200	0.44	0.162	0.132	6.19	7.56	-12.0	-12.0	-7.7	32.5	35.0	25.5	0.17
940529	0100	0.39	0.132	0.142	7.56	7.04	-18.0	-16.0	-17.2	31.0	33.3	25.5	0.18
940529	0400	0.39	0.132	0.132	7.56	7.56	-18.0	-34.0	-21.8	32.0	34.1	24.6	0.16
940529	0700	0.39	0.142	0.142	7.04	7.04	-16.0	-20.0	-20.5	35.8	36.5	28.9	0.18
940529	1000	0.37	0.142	0.162	7.04	6.19	-38.0	-36.0	-23.6	39.2	40.0	28.3	0.18
940529	1300	0.34	0.123	0.123	8.16	8.16	-34.0	-32.0	-17.2	36.0	36.7	33.0	0.20
940529	1600	0.34	0.132	0.123	7.56	8.16	-36.0	-34.0	-23.4	33.8	33.7	33.6	0.19
940529	1900	0.34	0.142	0.132	7.04	7.56	-36.0	-36.0	-25.7	33.5	32.2	33.0	0.22
940529	2200	0.34	0.142	0.142	7.04	7.04	-36.0	-32.0	-27.5	34.6	31.7	29.3	0.21
940530	0100	0.35	0.142	0.142	7.04	7.04	-36.0	-34.0	-33.9	38.3	30.2	37.2	0.22
940530	0400	0.38	0.240	0.103	4.17	9.71	-54.0	-54.0	-32.4	44.0	29.0	26.8	0.17
940530	0700	0.40	0.240	0.132	4.17	7.56	-52.0	-38.0	-34.4	37.1	28.7	29.7	0.18
940530	1000	0.48	0.201	0.230	4.98	4.35	-52.0	-50.0	-40.7	31.1	25.5	21.2	0.19
940530	1300	0.54	0.162	0.201	6.19	4.98	-40.0	-40.0	-36.8	21.8	20.8	18.4	0.16
940530	1600	0.59	0.142	0.152	7.04	6.59	-38.0	-38.0	-38.6	19.2	19.3	15.2	0.15
940530	1900	0.66	0.152	0.152	6.59	6.59	-40.0	-42.0	-41.9	20.2	19.9	18.1	0.17
940530	2200	0.68	0.191	0.142	5.24	7.04	-46.0	-42.0	-40.6	21.1	18.9	15.6	0.18
940531	0100	0.65	0.152	0.152	6.59	6.59	-40.0	-40.0	-42.4	20.7	20.5	15.2	0.16
940531	0400	0.68	0.162	0.162	6.19	6.19	-40.0	-38.0	-39.2	19.4	19.6	12.7	0.13
940531	0700	0.66	0.162	0.162	6.19	6.19	-38.0	-36.0	-38.1	20.5	20.5	11.8	0.14
940531	1000	0.68	0.152	0.152	6.59	6.59	-40.0	-40.0	-38.1	23.6	22.9	15.9	0.17
940531	1300	0.61	0.152	0.152	6.59	6.59	-40.0	-38.0	-38.8	26.3	24.4	17.3	0.19
940531	1600	0.61	0.162	0.152	6.19	6.59	-38.0	-38.0	-38.3	19.8	18.9	14.4	0.16
940531	1900	0.73	0.171	0.162	5.83	6.19	-42.0	-36.0	-39.4	19.1	17.7	15.4	0.14
940531	2200	0.73	0.181	0.181	5.52	5.52	-44.0	-42.0	-40.7	21.9	20.8	15.0	0.17

Appendix B
Time Series Graphs of Bulk Parameters

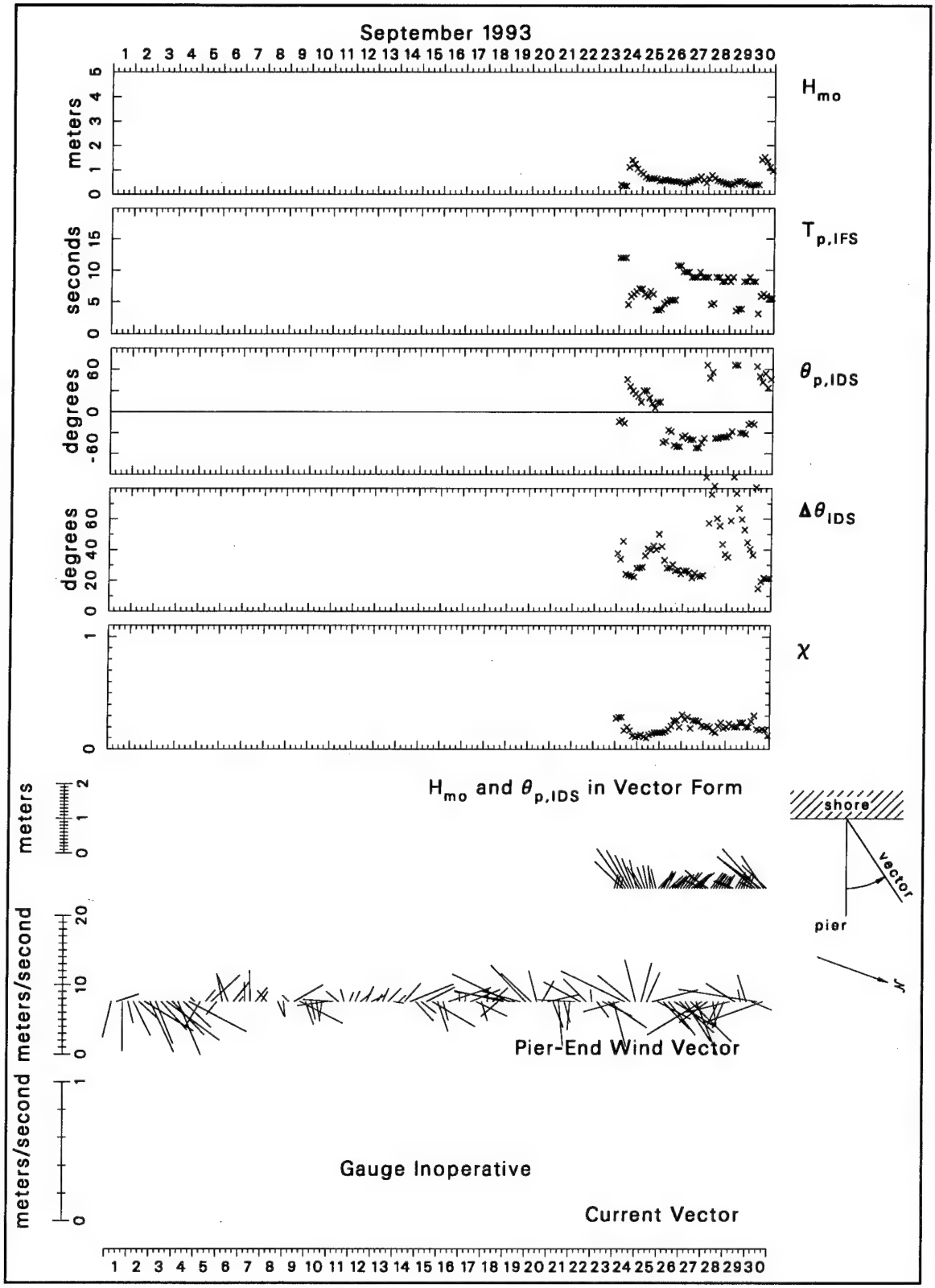

Figure B1. Bulk data for September 1993

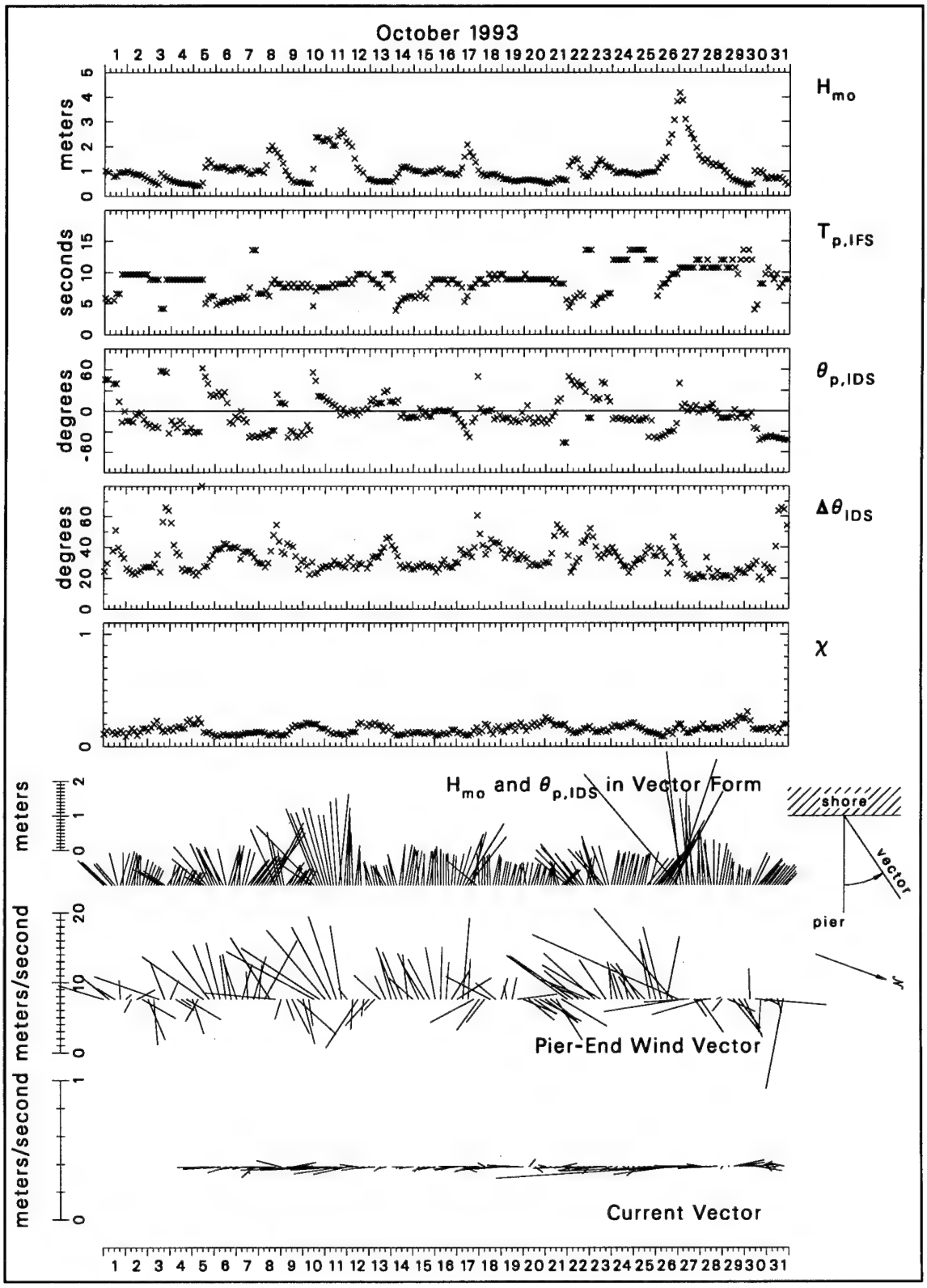

Figure B2. Bulk data for October 1993

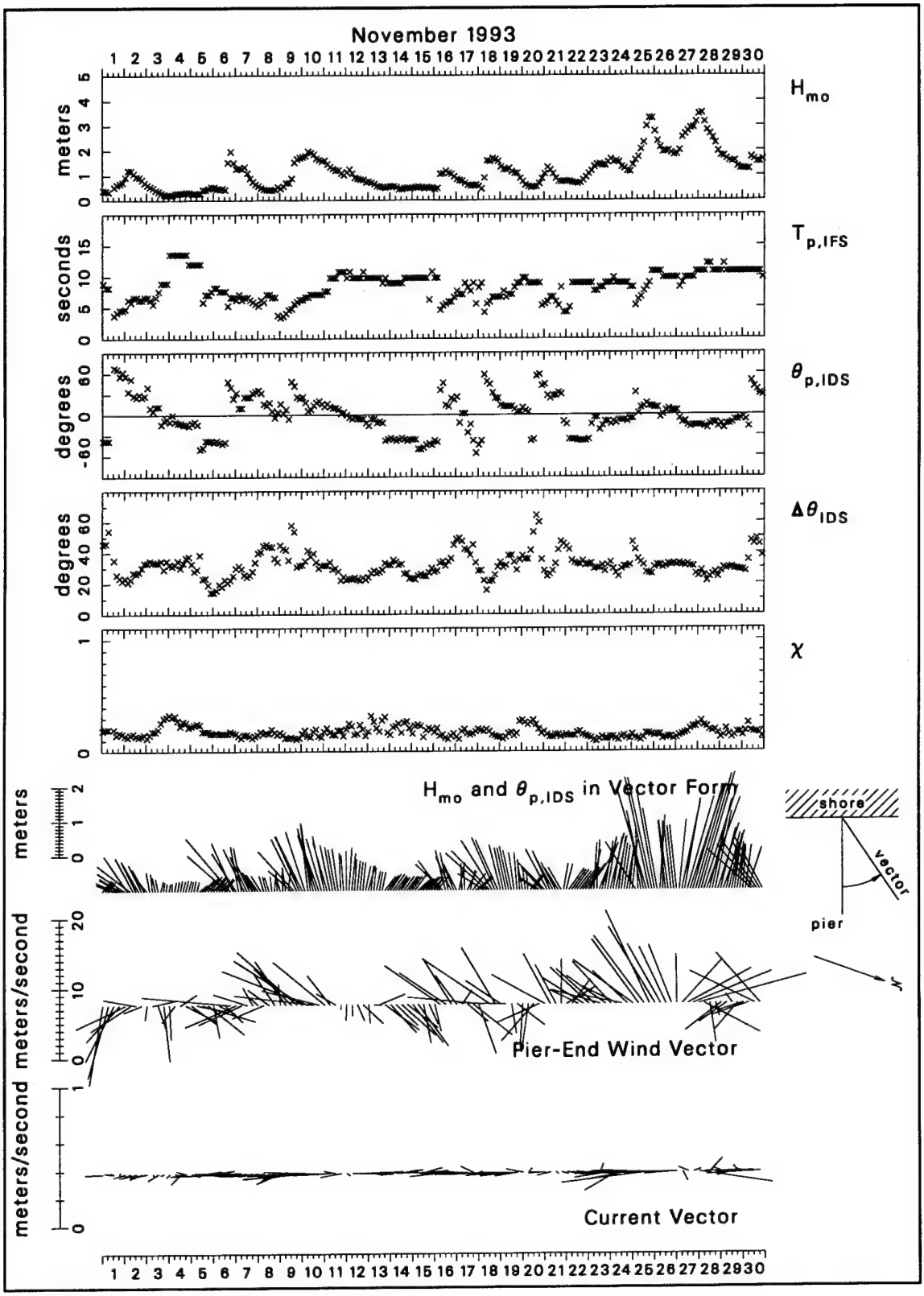

Figure B3. Bulk data for November 1993

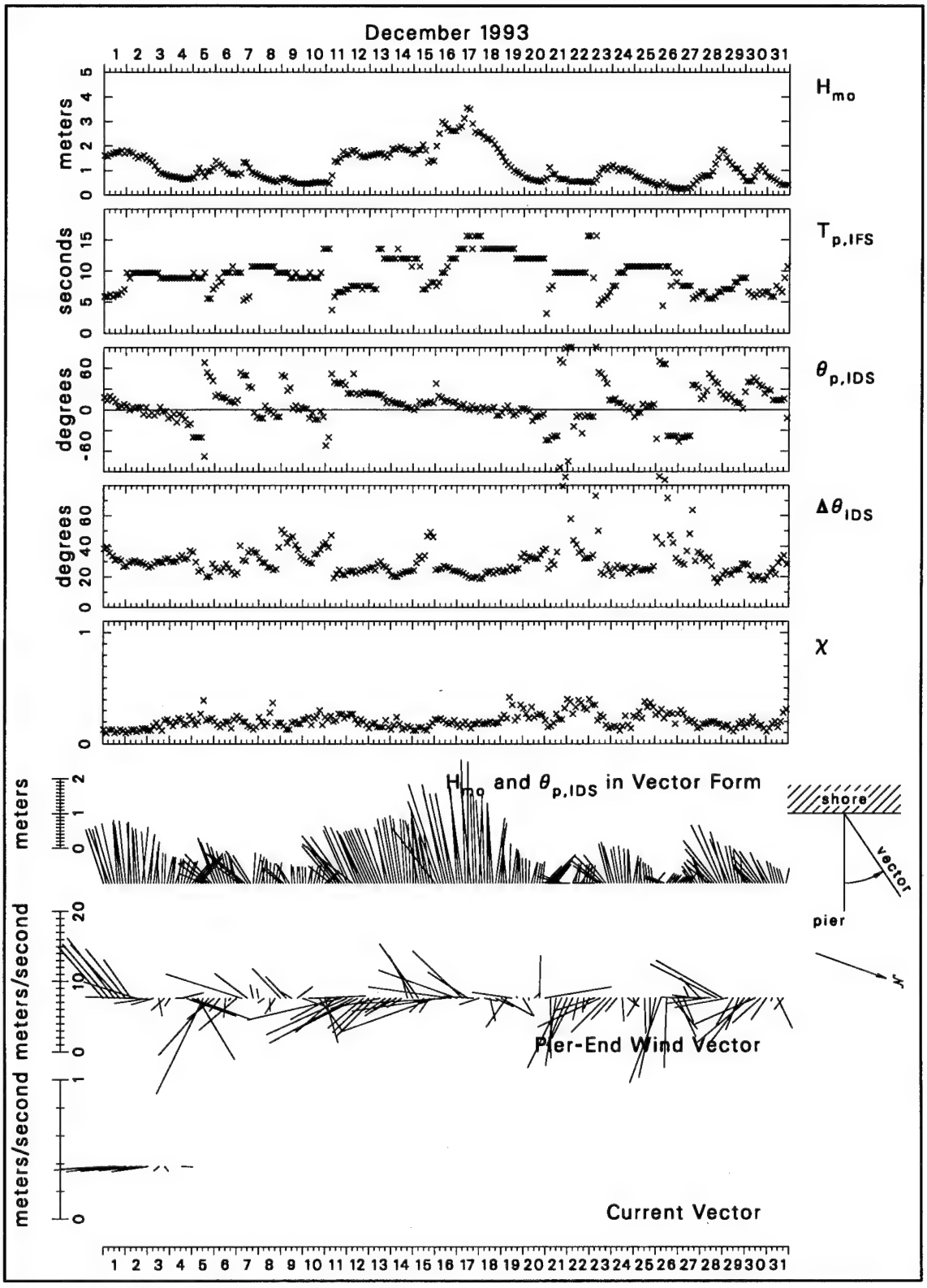

Figure B4. Bulk data for December 1993

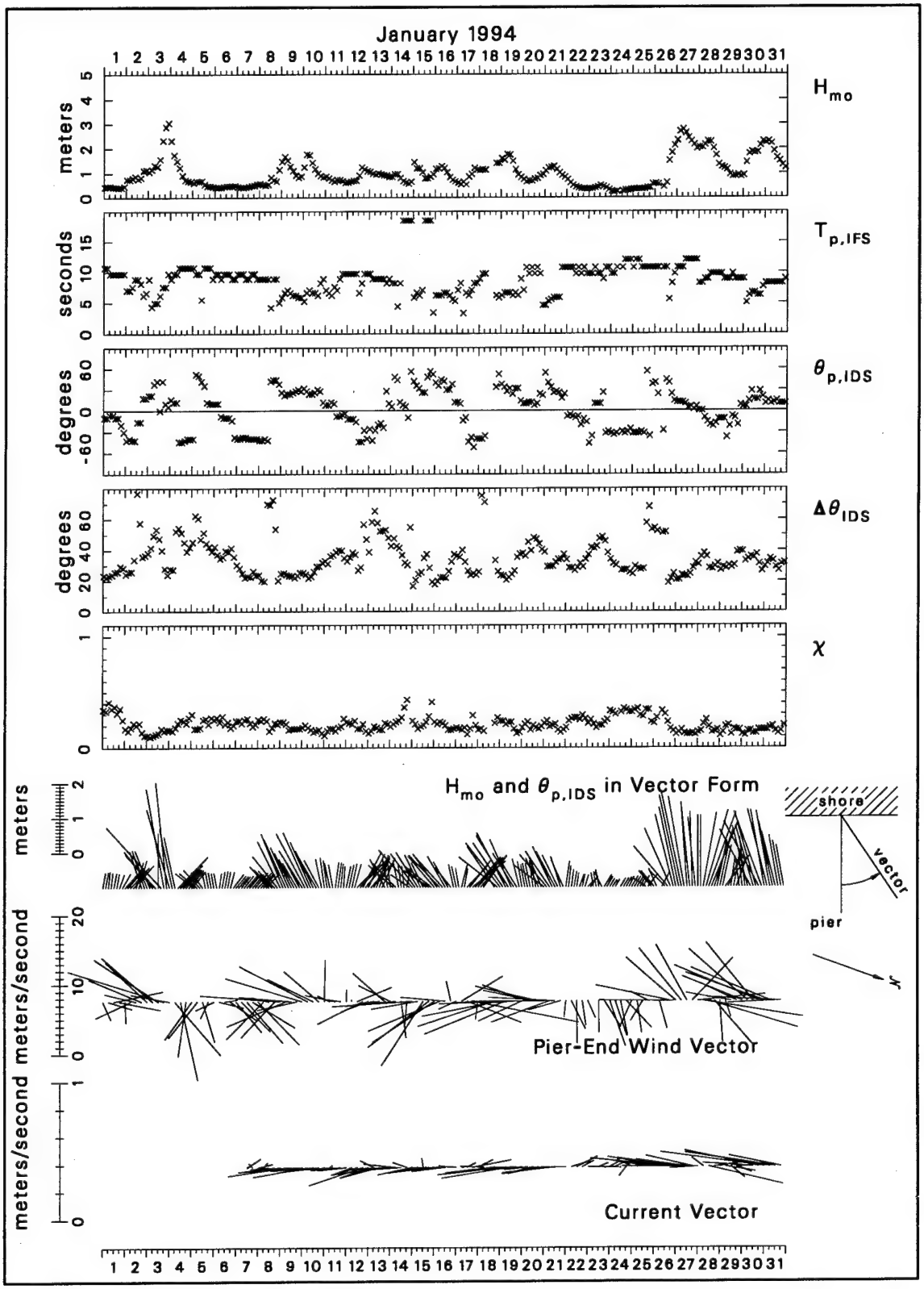

Figure B5. Bulk data for January 1994

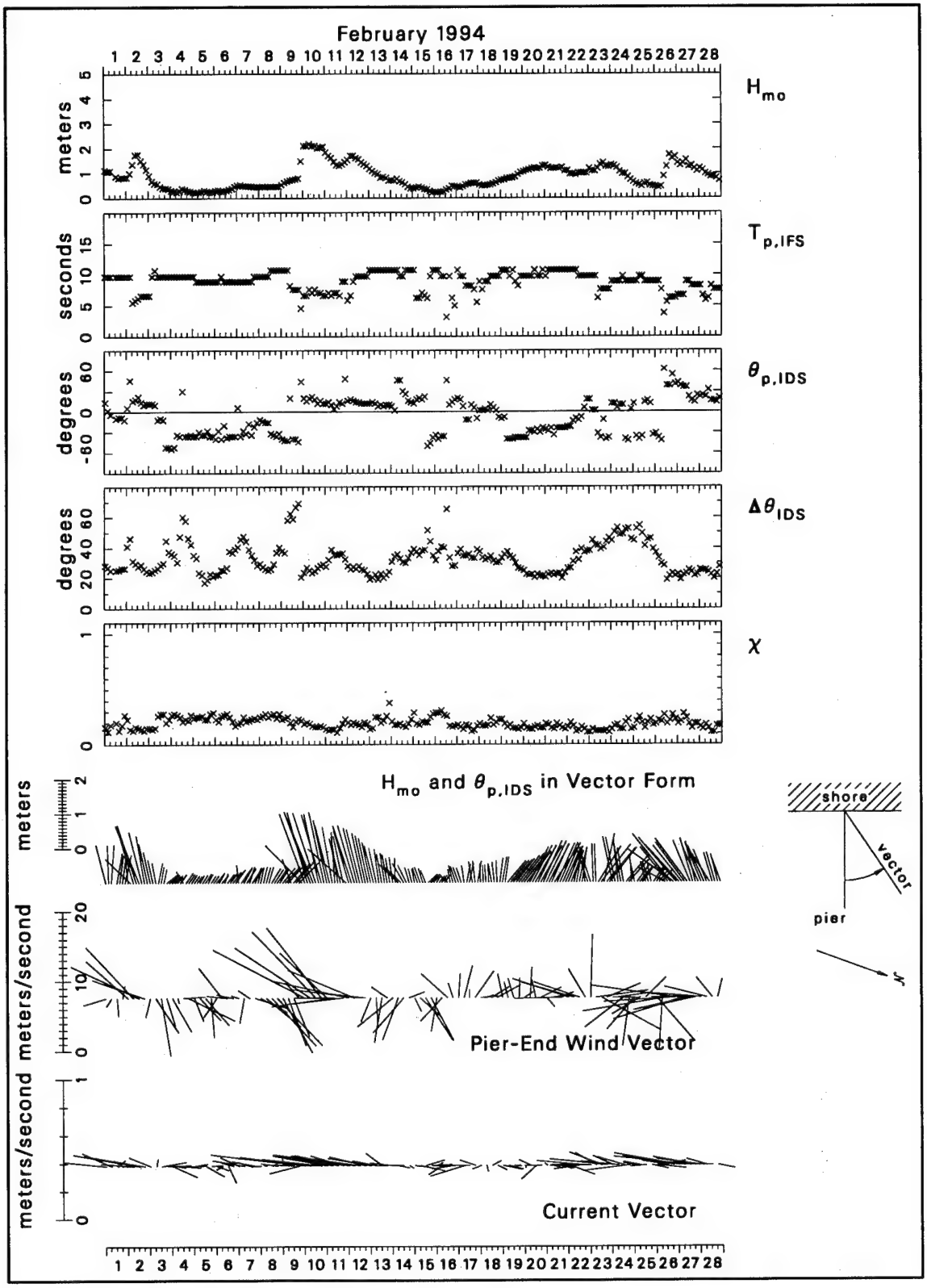

Figure B6. Bulk data for February 1994

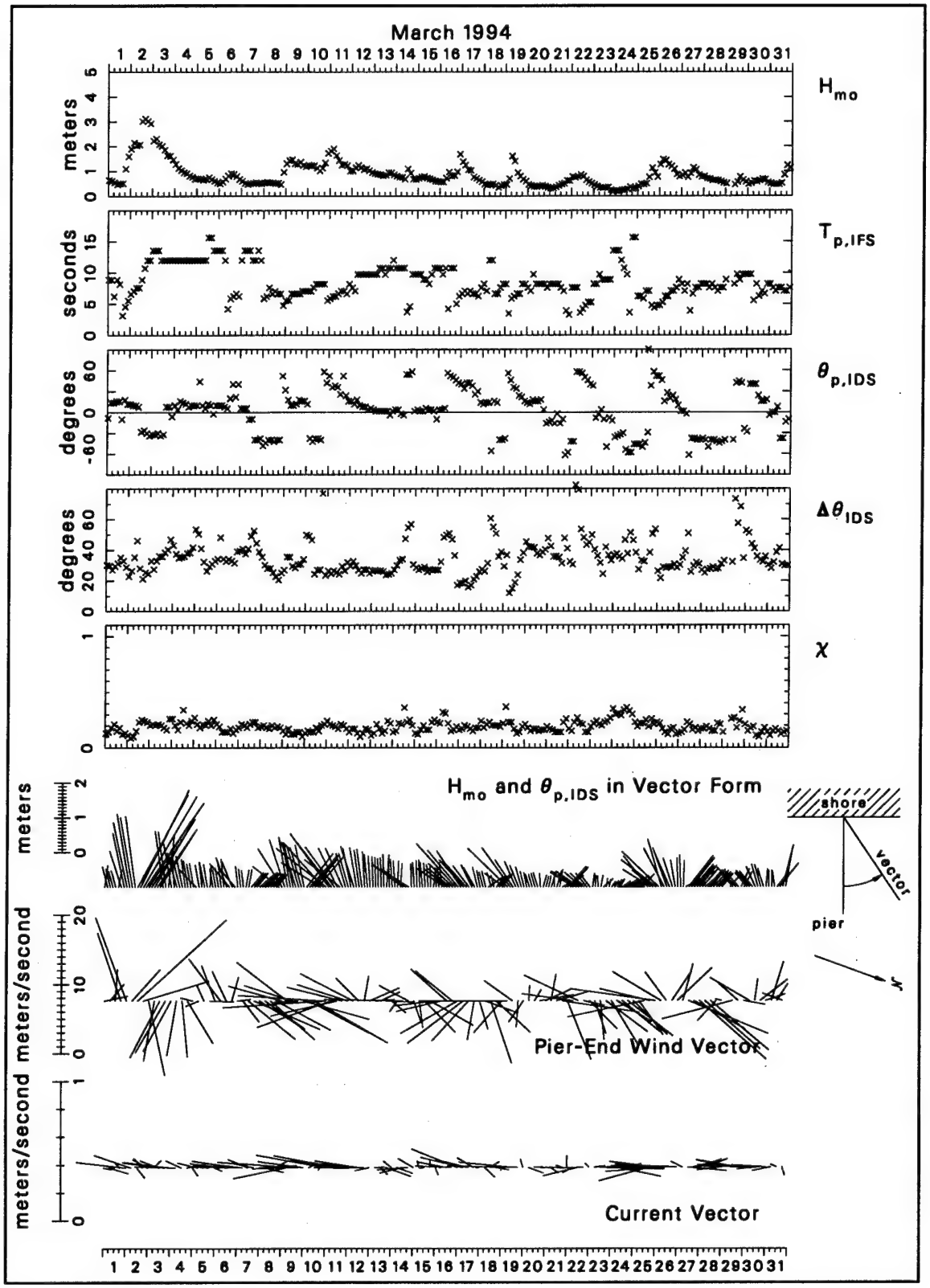

Figure B7. Bulk data for March 1994

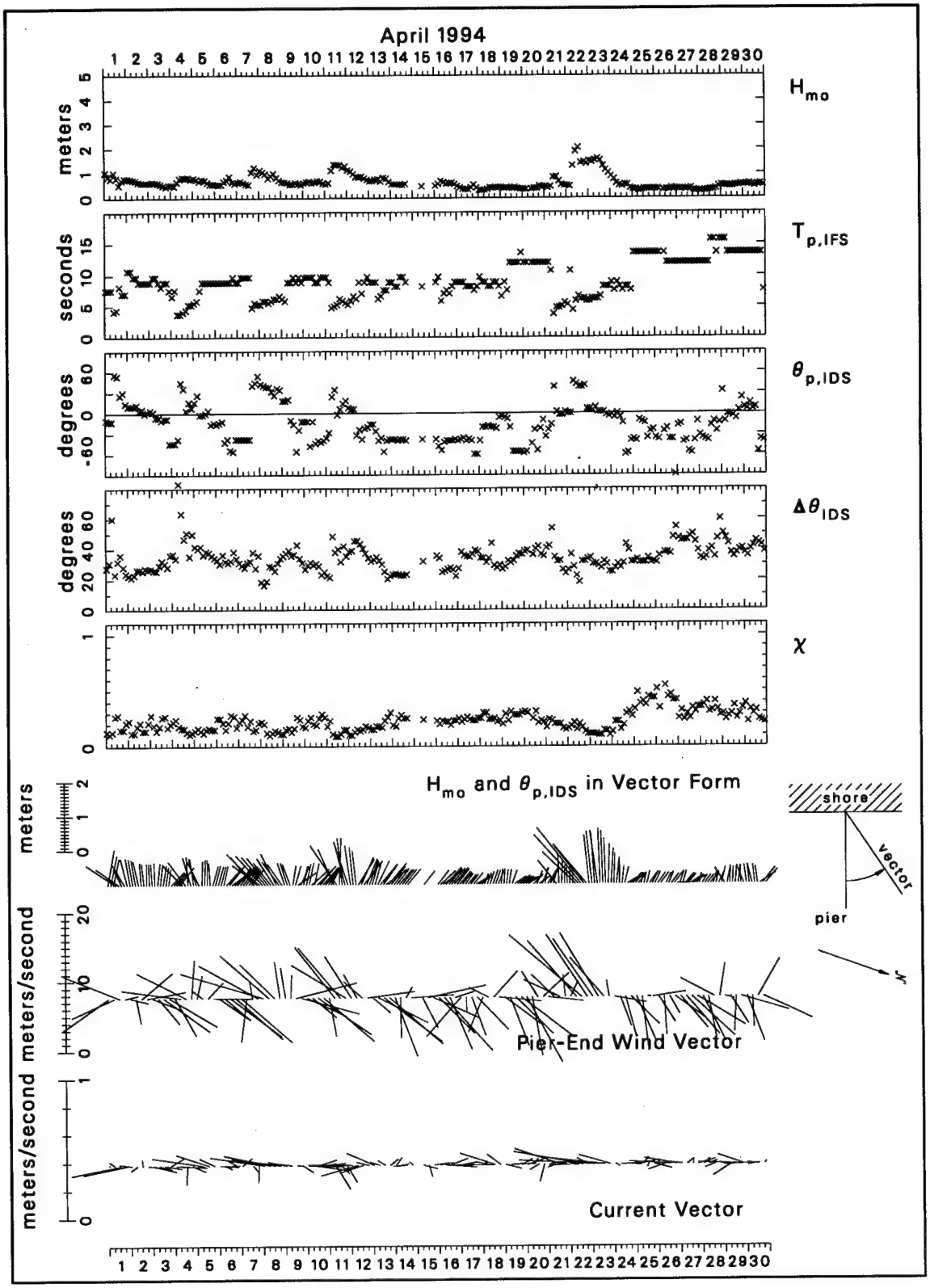

Figure B8. Bulk data for April 1994

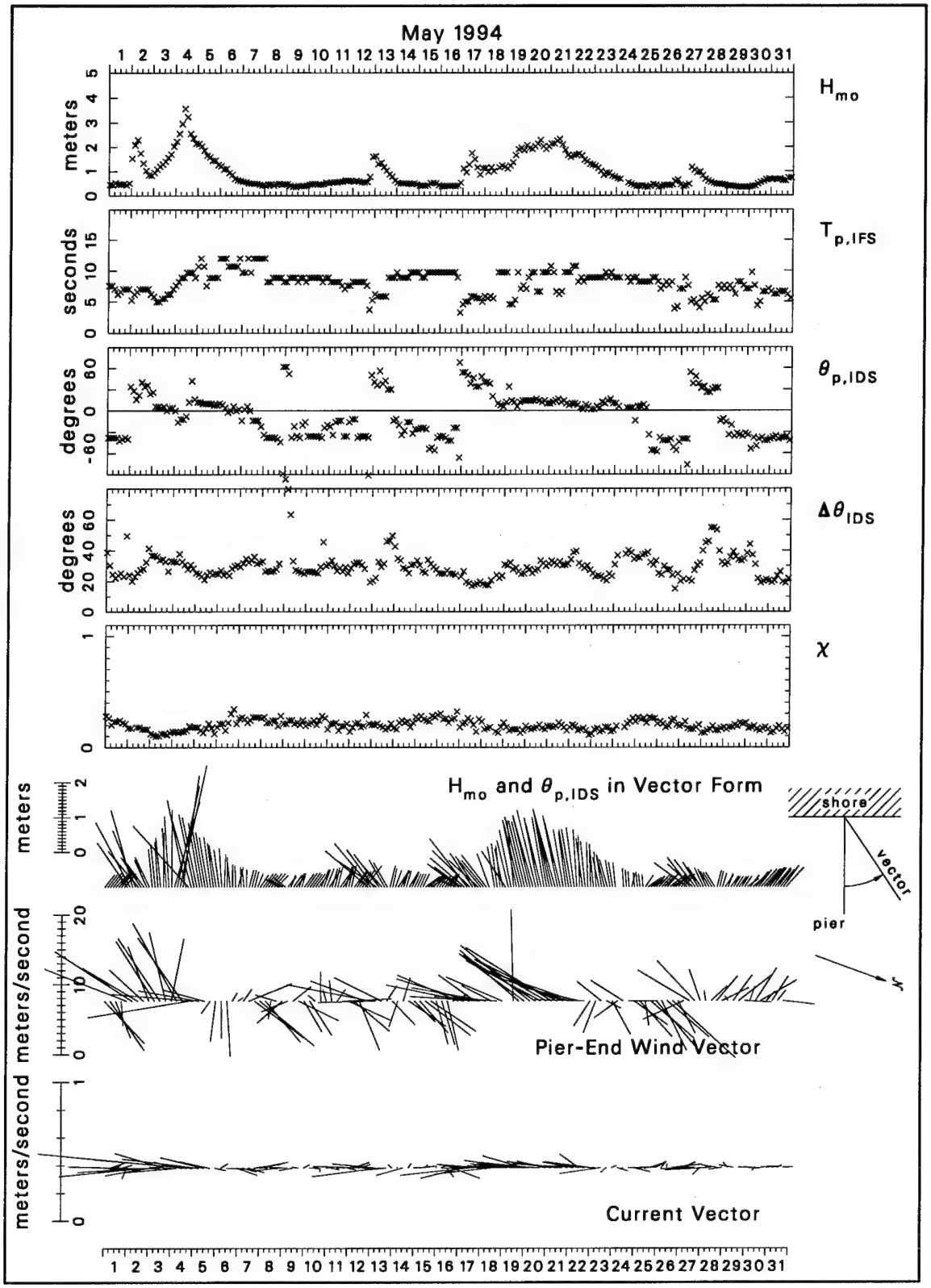

Figure B9. Bulk data for May 1994

Appendix C
Listing of FORTRAN Computer Program

```
      program readascii
c
c  This program has the codes to read FRF 8-m
c  array directional spectral ASCII output files.
c  This program simply reads the ASCII file and
c  writes an ASCII file as a test of the code.
c  You will have to tune the I/O statements to
c  your own system...
c
c  Variable names, units and meanings are:
c
c=====================================================================
c
c       datetime...[character*10] Date and Eastern Standard Time of
c                  beginning of data collection in the order year,
c                  month, day, hour, minute and in the form
c                  yymmddhhmm (2-digit year, no blanks in any field)
c            Hmo...[m] Energy-based characteristic wave height =
c                  4*sigma, where sigma^2 is the variance of sea
c                  surface displacement = volume under frequency-
c                  direction (f-d) spectrum
c             fp...[Hz] Frequency at the peak of the frequency spectrum
c            thp...[deg] Direction at the peak of the directional
c                  distribution at f=fp
c
c         ifimle...Algorithm flag: [1]=IMLE estimate, [0]=MLE estimate
c
c          istot...[sec] Length of time series processed
c           sfrq...[Hz] Data sampling frequency in time series
c
c        ifwindo...Windowing flag: [0]=data segments not windowed,
c                  [1]=data segments windowed (Kaiser-Bessel window)
c        ifdtrnd...Detrending flag: [0]=data segments not detrended,
c                  [1]=data segments detrended (linear trend removed)
c           nfft...Number of data points in a data segment
c          nensb...Number of half-lapped segments analyzed
c          nband...Number of frequency bands averaged for frequency
c                  smoothing
c          idgfr...Degrees of freedom of final frequency spectral
c                  estimates
c
c          nofrq...Number of output frequency bands
c          delfs...[Hz] Width of an output frequency band
c          noang...Number of output direction bins (arcs)
c        odelang...[deg] Width of an output direction bin
c
```

Figure C1. Listing of FORTRAN Computer Program (Sheet 1 of 3)

```
c          dmin...[m] Minimum water depth during time series at
c                 8-m array reference gage 'rname'
c          dbar...[m] Mean water depth during time series at
c                 reference gage
c          dmax...[m] Maximum water depth during time series at
c                 reference gage
c         rname...Reference gage ID (FRF gage name - get help if
c                 you need to know which 8-m array gage it was)
c
c           s9b...[m/sec] Mean wind speed at pier end anemometer
c                 (19.5 m above mean sea level) during time series
c           s9s...[m/sec] Standard deviation of wind speed at pier
c                 end anemometer
c           s9m...[m/sec] Maximum wind speed at pier end anemometer
c           d9b...[deg] Vector averaged mean wind direction at pier
c                 end anemometer - direction from which wind blows
c                 in wave direction coordinates (degrees counter-
c                 clockwise from shore normal)
c           d9s...[deg] Measure of variability of wind direction at pier
c                 end anemometer = arctangent[(standard deviation of
c                 cross-mean-streamline wind speed)/(mean wind speed)]
c
c           s6b...   These are the same as s9b, s9s, s9m, d9b,
c           s6s...      and d9s, except they are from the building
c           s6m...        anemometer at the landward end of the
c           d6b...          pier and 19.5 m above mean sea level
c           d6s...
c
c        oangle...[deg] Array of wave direction coordinates that
c                 aligns with the f-d spectral array
c
c           nof...(Within a loop) Frequency index
c       of(nof)...[Hz] Frequency
c      osf(nof)...[m^2/Hz] Frequency spectral density at frequency
c                 of(nof)
c    ogpat(nof)...[character*16] Encoded list of gages used to compute
c                 directional distribution of energy at this frequency
c    itero(nof)...Number of IMLE iterations used to compute directional
c                 distribution of energy at this frequency
c  ospc(nof,noa)...[1/deg] Normalized frequency-direction spectral den-
c                 sity at frequency of(nof) and direction oangle(noa).
c                 Dimensional frequency-direction spectrum spc(nof,noa)
c                 [in m^2/(Hz deg)] is found from:
c
c                        spc(nof,noa) = osf(nof)*ospc(nof,noa)
c
c=======================================================================
c
c  links:  none
c
      character*4               rname
      character*10             datetime
      character*16            ogpat(29)
      character*16              infile,        outfile
      dimension                 of(29),        osf(29),      itero(29)
      dimension              oangle(181),   ospc(29,181)
c
c  ask user for input and output file names
c
      write(*,'(2x,''Enter input file name...: '')')
      read(*,'(a)') infile
      write(*,'(2x,''Enter output file name...: '')')
      read(*,'(a)') outfile
c
c  open input file and read data
c
      open(10,file=infile,status='unknown',access='sequential',
     &  form='formatted')
c
      read(10,'(a10,f10.2,f10.5,f10.1,2i10,f10.2,i10)')
     &    datetime,      Hmo,       fp,      thp,
     &      ifimle,    istot,     sfrq,  ifwindo
```

Figure C1. (Sheet 2 of 3)

```
c
      read(10,'(6i10,f10.5,i10)')
     &       ifdtrnd,       nfft,      nensb,      nband,
     &         idgfr,      nofrq,      delfs,      noang
c
      read(10,'(4f10.2,6x,a4,3f10.2)')
     &       odelang,       dmin,       dbar,       dmax,
     &         rname,        s9b,        s9s,        s9m
c
      read(10,'(2f10.1,3f10.2,2f10.1)')
     &           d9b,        d9s,        s6b,        s6s,
     &           s6m,        d6b,        d6s
c
      read(10,'(10f8.1)') (oangle(noa),noa=1,noang)
c
      do 700 nof=1,nofrq
c
        read(10,'(i10,f10.5,e20.7,4x,a16,i10)')
     &          nof,    of(nof),   osf(nof), ogpat(nof),
     &    itero(nof)
c
        read(10,'(8f10.7)') (ospc(nof,noa),noa=1,noang)
c
700   continue
c
      close(10)
c
c  open output file and write variables just read
c
      open(11,file=outfile,status='unknown',access='sequential',
     &  form='formatted')
c
      write(11,'(a10,f10.2,f10.5,f10.1,2i10,f10.2,i10)')
     &    datetime,      Hmo,       fp,      thp,
     &      ifimle,    istot,     sfrq,  ifwindo
c
      write(11,'(6i10,f10.5,i10)')
     &       ifdtrnd,       nfft,      nensb,      nband,
     &         idgfr,      nofrq,      delfs,      noang
c
      write(11,'(4f10.2,6x,a4,3f10.2)')
     &       odelang,       dmin,       dbar,       dmax,
     &         rname,        s9b,        s9s,        s9m
c
      write(11,'(2f10.1,3f10.2,2f10.1)')
     &           d9b,        d9s,        s6b,        s6s,
     &           s6m,        d6b,        d6s
c
      write(11,'(10f8.1)') (oangle(noa),noa=1,noang)
c
      do 800 nof=1,nofrq
c
        write(11,'(i10,f10.5,e20.7,4x,a16,i10)')
     &          nof,    of(nof),   osf(nof), ogpat(nof),
     &    itero(nof)
c
        write(11,'(8f10.7)') (ospc(nof,noa),noa=1,noang)
c
800   continue
c
      close(11)
c
      end
```

Figure C1. (Sheet 3 of 3)

Appendix D
Listing of Sample Data File

```
9310210100       0.50   0.11279     -24.0         1       8192       2.00         1
         0       2048        15        10       160         29    0.00977         91
      2.00       8.11      8.32      8.49       191       5.57       0.67       8.14
    -125.0        6.1      3.50      0.86      6.89     -115.8       12.2
     -90.0    -88.0    -86.0    -84.0    -82.0    -80.0    -78.0    -76.0    -74.0    -72.0
     -70.0    -68.0    -66.0    -64.0    -62.0    -60.0    -58.0    -56.0    -54.0    -52.0
     -50.0    -48.0    -46.0    -44.0    -42.0    -40.0    -38.0    -36.0    -34.0    -32.0
     -30.0    -28.0    -26.0    -24.0    -22.0    -20.0    -18.0    -16.0    -14.0    -12.0
     -10.0     -8.0     -6.0     -4.0     -2.0      0.0      2.0      4.0      6.0      8.0
      10.0     12.0     14.0     16.0     18.0     20.0     22.0     24.0     26.0     28.0
      30.0     32.0     34.0     36.0     38.0     40.0     42.0     44.0     46.0     48.0
      50.0     52.0     54.0     56.0     58.0     60.0     62.0     64.0     66.0     68.0
      70.0     72.0     74.0     76.0     78.0     80.0     82.0     84.0     86.0     88.0
      90.0
         1   0.04443       0.5187181E-02    72456                          30
 0.0080223 0.0079863 0.0077956 0.0074416 0.0069404 0.0063168 0.0056052 0.0048449
 0.0040809 0.0033585 0.0027167 0.0021847 0.0017776 0.0015008 0.0013529 0.0013378
 0.0014720 0.0017933 0.0023609 0.0032392 0.0044605 0.0059871 0.0076797 0.0093173
 0.0106595 0.0115205 0.0118028 0.0115302 0.0108120 0.0098167 0.0087257 0.0077018
 0.0068727 0.0063295 0.0061365 0.0063464 0.0070068 0.0081402 0.0096908 0.0114591
 0.0130884 0.0141534 0.0143316 0.0135475 0.0119915 0.0100130 0.0079728 0.0061370
 0.0046425 0.0035176 0.0027256 0.0022051 0.0018971 0.0017576 0.0017621 0.0019039
 0.0021918 0.0026444 0.0032817 0.0041129 0.0051196 0.0062381 0.0073486 0.0082799
 0.0088359 0.0088568 0.0082818 0.0071938 0.0058107 0.0044002 0.0031822 0.0022647
 0.0016485 0.0012774 0.0010851 0.0010221 0.0010585 0.0011789 0.0013755 0.0016424
 0.0019708 0.0023479 0.0027566 0.0031781 0.0035930 0.0039820 0.0043300 0.0046230
 0.0048511 0.0050069 0.0050758
         2   0.05420       0.2076107E-01    72456                          30
 0.0031912 0.0031914 0.0031647 0.0031059 0.0030152 0.0028934 0.0027425 0.0025651
 0.0023659 0.0021514 0.0019297 0.0017109 0.0015054 0.0013238 0.0011754 0.0010683
 0.0010092 0.0010054 0.0010667 0.0012075 0.0014478 0.0018126 0.0023278 0.0030148
 0.0038844 0.0049337 0.0061438 0.0074843 0.0089155 0.0103934 0.0118725 0.0133104
 0.0146768 0.0159639 0.0171941 0.0184088 0.0196250 0.0207670 0.0216319 0.0219489
 0.0215176 0.0203198 0.0185205 0.0163840 0.0141771 0.0121106 0.0103196 0.0088696
 0.0077715 0.0069987 0.0065011 0.0062147 0.0060681 0.0059884 0.0059077 0.0057713
 0.0055443 0.0052138 0.0047860 0.0042819 0.0037305 0.0031639 0.0026128 0.0021033
 0.0016550 0.0012794 0.0009799 0.0007525 0.0005888 0.0004779 0.0004091 0.0003741
 0.0003671 0.0003849 0.0004262 0.0004907 0.0005780 0.0006870 0.0008151 0.0009580
 0.0011104 0.0012666 0.0014207 0.0015675 0.0017028 0.0018231 0.0019260 0.0020100
 0.0020740 0.0021173 0.0021368
         3   0.06396       0.1008572E+00    72456                          16
 0.0005109 0.0005114 0.0005131 0.0005157 0.0005194 0.0005240 0.0005294 0.0005356
 0.0005424 0.0005497 0.0005574 0.0005652 0.0005733 0.0005816 0.0005903 0.0006002
 0.0006124 0.0006285 0.0006512 0.0006841 0.0007320 0.0008013 0.0009000 0.0010388
 0.0012317 0.0014973 0.0018612 0.0023600 0.0030463 0.0039979 0.0053295 0.0072060
 0.0098486 0.0135060 0.0183326 0.0241084 0.0298900 0.0340718 0.0353239 0.0336834
 0.0304031 0.0268391 0.0237482 0.0213166 0.0194270 0.0178545 0.0163713 0.0148106
 0.0131098 0.0113159 0.0095441 0.0079135 0.0065008 0.0053308 0.0043892 0.0036427
 0.0030531 0.0025852 0.0022099 0.0019045 0.0016520 0.0014402 0.0012606 0.0011078
```

Figure D1. Listing of sample data file (Sheet 1 of 6)

```
 0.0009780 0.0008689 0.0007784 0.0007042 0.0006441 0.0005954 0.0005556 0.0005227
 0.0004946 0.0004702 0.0004486 0.0004290 0.0004112 0.0003950 0.0003803 0.0003670
 0.0003550 0.0003444 0.0003350 0.0003268 0.0003199 0.0003141 0.0003095 0.0003059
 0.0003034 0.0003020 0.0003016
         4    0.07373        0.5252190E-01     72456                    20
 0.0004164 0.0004181 0.0004227 0.0004303 0.0004412 0.0004556 0.0004737 0.0004961
 0.0005232 0.0005556 0.0005941 0.0006393 0.0006922 0.0007534 0.0008239 0.0009042
 0.0009947 0.0010953 0.0012057 0.0013255 0.0014547 0.0015945 0.0017483 0.0019231
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 0.0003677 0.0003494 0.0003339 0.0003208 0.0003100 0.0003012 0.0002943 0.0002891
 0.0002855 0.0002834 0.0002829
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 0.0005813 0.0005321 0.0004949 0.0004666 0.0004450 0.0004283 0.0004152 0.0004049
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 0.0003651 0.0003642 0.0003639
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 0.0001632 0.0001588 0.0001548 0.0001512 0.0001482 0.0001455 0.0001434 0.0001417
 0.0001405 0.0001397 0.0001395
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 0.0001522 0.0001490 0.0001462 0.0001443 0.0001439 0.0001458 0.0001509 0.0001608
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 0.0001094 0.0001044 0.0001007 0.0000978 0.0000957 0.0000941 0.0000929 0.0000921
 0.0000916 0.0000913 0.0000912
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 0.0062280 0.0053186 0.0043354 0.0033924 0.0025711 0.0019078 0.0014018 0.0010308
 0.0007659 0.0005792 0.0004484 0.0003564 0.0002915 0.0002451 0.0002117 0.0001874
 0.0001694 0.0001559 0.0001456 0.0001375 0.0001310 0.0001256 0.0001211 0.0001171
 0.0001136 0.0001106 0.0001078 0.0001054 0.0001033 0.0001015 0.0001001 0.0000990
 0.0000982 0.0000977 0.0000976
         9    0.12256        0.1500162E+00     72456                    30
 0.0001678 0.0001680 0.0001685 0.0001694 0.0001707 0.0001726 0.0001753 0.0001789
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```

Figure D1. (Sheet 2 of 6)

```
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0.0253615 0.0293027 0.0304312 0.0276855 0.0227801 0.0181900 0.0151363 0.0137279
0.0137000 0.0146709 0.0159759 0.0165630 0.0155786 0.0132606 0.0106994 0.0087661
0.0077249 0.0075125 0.0079669 0.0087917 0.0094238 0.0091990 0.0079348 0.0061493
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0.0001055 0.0001009 0.0000973 0.0000946 0.0000926 0.0000912 0.0000901 0.0000894
0.0000889 0.0000887 0.0000886
        10    0.13232        0.9761900E-01     72456                    12
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0.0003514 0.0003582 0.0003659 0.0003754 0.0003881 0.0004064 0.0004340 0.0004761
0.0005411 0.0006413 0.0007972 0.0010418 0.0014289 0.0020428 0.0030023 0.0044379
0.0064067 0.0087454 0.0110164 0.0127702 0.0139620 0.0150042 0.0163973 0.0183133
0.0203039 0.0213486 0.0206431 0.0185220 0.0161598 0.0145299 0.0140004 0.0144964
0.0155897 0.0164680 0.0162713 0.0148734 0.0130538 0.0117051 0.0112429 0.0116289
0.0124690 0.0130438 0.0126625 0.0113120 0.0096804 0.0084480 0.0078601 0.0077935
0.0078688 0.0075541 0.0065032 0.0049219 0.0033624 0.0021925 0.0014497 0.0010183
0.0007789 0.0006509 0.0005867 0.0005578 0.0005456 0.0005363 0.0005204 0.0004929
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0.0001822 0.0001715 0.0001639 0.0001587 0.0001553 0.0001532 0.0001520 0.0001514
0.0001511 0.0001510 0.0001511
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0.0002888 0.0002907 0.0002945 0.0003000 0.0003071 0.0003163 0.0003276 0.0003415
0.0003583 0.0003787 0.0004032 0.0004330 0.0004691 0.0005133 0.0005677 0.0006356
0.0007209 0.0008297 0.0009703 0.0011543 0.0013987 0.0017267 0.0021708 0.0027738
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0.0005320 0.0004775 0.0004337 0.0003982 0.0003691 0.0003452 0.0003255 0.0003092
0.0002957 0.0002845 0.0002754 0.0002679 0.0002619 0.0002573 0.0002539 0.0002515
0.0002503 0.0002500 0.0002504
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0.0220439 0.0191741 0.0156168 0.0124130 0.0100294 0.0084913 0.0076549 0.0073628
0.0074786 0.0078575 0.0082979 0.0085242 0.0082641 0.0074088 0.0061102 0.0046824
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0.0003215 0.0002705 0.0002334 0.0002061 0.0001857 0.0001703 0.0001585 0.0001495
0.0001426 0.0001373 0.0001332 0.0001302 0.0001279 0.0001263 0.0001251 0.0001244
0.0001241 0.0001240 0.0001242
        13    0.16162        0.3928215E-01     23456                    10
0.0003180 0.0003206 0.0003260 0.0003339 0.0003446 0.0003585 0.0003761 0.0003982
0.0004258 0.0004601 0.0005028 0.0005563 0.0006235 0.0007084 0.0008165 0.0009549
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0.0001777 0.0001737 0.0001709 0.0001689 0.0001675 0.0001667 0.0001662 0.0001661
0.0001663 0.0001667 0.0001671
        14    0.17139        0.3609566E-01     23456                     8
0.0007748 0.0007798 0.0007903 0.0008056 0.0008264 0.0008534 0.0008880 0.0009318
0.0009870 0.0010568 0.0011452 0.0012580 0.0014030 0.0015911 0.0018372 0.0021620
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```

Figure D1. (Sheet 3 of 6)

```
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0.0159723 0.0172406 0.0183254 0.0187963 0.0183278 0.0169210 0.0149117 0.0127497
0.0107739 0.0091405 0.0078683 0.0069065 0.0061806 0.0056141 0.0051376 0.0046946
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0.0003560 0.0003549 0.0003543 0.0003541 0.0003541 0.0003542 0.0003546 0.0003551
0.0003559 0.0003569 0.0003578
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0.0009594 0.0010361 0.0011318 0.0012521 0.0014046 0.0015999 0.0018530 0.0021846
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0.0149552 0.0168375 0.0179076 0.0179831 0.0171664 0.0157757 0.0141847 0.0126927
0.0114808 0.0106326 0.0101743 0.0101086 0.0104325 0.0111400 0.0122101 0.0135818
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0.0004351 0.0004340 0.0004345
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0.0028143 0.0027771 0.0026602 0.0024801 0.0022607 0.0020266 0.0017978 0.0015880
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0.0007216 0.0006941 0.0006726 0.0006559 0.0006432 0.0006338 0.0006271 0.0006227
0.0006202 0.0006196 0.0006201
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0.0188432 0.0188090 0.0187584 0.0187484 0.0187178 0.0184810 0.0177770 0.0163921
0.0143126 0.0117871 0.0092152 0.0069461 0.0051537 0.0038445 0.0029356 0.0023238
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0.0004363 0.0004083 0.0003854 0.0003670 0.0003523 0.0003408 0.0003322 0.0003260
0.0003222 0.0003205 0.0003204
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0.0007526 0.0007604 0.0007774 0.0008034 0.0008398 0.0008892 0.0009547 0.0010413
0.0011556 0.0013073 0.0015097 0.0017820 0.0021504 0.0026508 0.0033291 0.0042382
0.0054265 0.0069124 0.0086427 0.0104510 0.0120550 0.0131347 0.0134791 0.0131027
0.0122354 0.0111966 0.0102655 0.0096242 0.0093695 0.0095504 0.0101914 0.0112891
0.0127750 0.0144623 0.0160224 0.0170590 0.0172855 0.0166903 0.0155394 0.0142196
0.0130668 0.0122896 0.0119777 0.0121305 0.0126537 0.0133180 0.0137279 0.0134157
0.0121162 0.0100175 0.0076637 0.0055764 0.0039995 0.0029264 0.0022437 0.0018327
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0.0022185 0.0022041 0.0020997 0.0019222 0.0017007 0.0014660 0.0012423 0.0010440
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0.0003394 0.0003224 0.0003098 0.0003007 0.0002942 0.0002897 0.0002869 0.0002852
0.0002845 0.0002845 0.0002849
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0.0021804 0.0021901 0.0021971 0.0021972 0.0021912 0.0021804 0.0021667 0.0021531
0.0021433 0.0021426 0.0021578 0.0021975 0.0022731 0.0024000 0.0025987 0.0028979
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```

Figure D1. (Sheet 4 of 6)

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0.0012445 0.0009551 0.0007805 0.0006834 0.0006393 0.0006332 0.0006559 0.0007007
0.0007619 0.0008334 0.0009080 0.0009780 0.0010358 0.0010750 0.0010918 0.0010855
0.0010584 0.0010152 0.0009614 0.0009025 0.0008432 0.0007870 0.0007360 0.0006913
0.0006531 0.0006214 0.0005955 0.0005749 0.0005588 0.0005467 0.0005379 0.0005321
0.0005289 0.0005280 0.0005287
      21   0.23975       0.2621384E-01    2345                    8
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0.0009629 0.0009700 0.0009736
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0.0013620 0.0013915 0.0013440 0.0012281 0.0010793 0.0009328 0.0008074 0.0007070
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0.0003206 0.0003220 0.0003227
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Figure D1. (Sheet 5 of 6)

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0.0002870 0.0002881 0.0002915 0.0002963 0.0003019 0.0003075 0.0003128 0.0003172
0.0003205 0.0003224 0.0003230
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```

Figure D1. (Sheet 6 of 6)

Appendix E
Notation

Text	Appendix C	
	datetime	Ten-character string that contains date and time
	dbar	Mean water depth
	dmax	Maximum segment-averaged water depth in a collection
	dmin	Minimum segment-averaged water depth in a collection
df	delfs	Frequency increment
	d6b	Vector-averaged mean wind direction at building anemometer
	d6s	Measure of variability of wind direction at building anemometer
	d9b	Vector-averaged mean wind direction at pier-end anemometer
	d9s	Measure of variability of wind direction at pier-end anemometer
$d\theta$	odelang	Direction increment
$D(f_n, \theta_m)$		Directional distribution function at frequency f_n and direction θ_m
E_i		Incident wave energy
E_r		Reflected wave energy

Text	Appendix C	
f		Frequency
f_n		n^{th} frequency of a set of N discrete frequencies
f_p		Peak frequency
	`fp`	Frequency at peak of frequency spectrum
$f_{p,FD}$		Frequency at peak of frequency-direction spectrum
$f_{p,IFS}$		Frequency at peak of integrated frequency spectrum
g		Gravitational acceleration
hhmm		Mnemonic for time of day
H_{mo}	`Hmo`	Characteristic wave height
$H_{mo,i}$		Characteristic incident wave height
$H_{mo,r}$		Characteristic reflected wave height
	`idgfr`	Degrees of freedom in cross-spectral estimation
	`ifdtrnd`	Flag indicating whether or not data have been detrended
	`ifimle`	Flag indicating if maximum likelihood or iterative maximum likelihood estimation is used
	`ifwindo`	Flag indicating whether or not data segments have been windowed
	`istot`	Total number of seconds duration of a time series
	`itero(nof)`	Number of iterative maximum likelihood iterations used to compute directional distribution at frequency `of(nof)`
$I(f_n, \theta_j)$		Cumulative distribution function at frequency f_n and direction θ_m

Text	Appendix C	
j		Index associated with discrete direction
m	noa	Index associated with discrete direction
M	noang	Integer number of discrete directions
n	nof	Index associated with discrete frequency
	nband	Number of frequency bands averaged in spectral estimation
	nensb	Number of segments into which a data record is divided during spectral estimation
	nfft	Number of data points in a data segment
N	nofrq	Integer number of discrete frequencies
	oangle(noa)	Element noa of an array that represents direction coordinates
	of(nof)	Element nof of an array that represents frequency
	ogpat(nof)	Element nof of an array of 16-character strings that represent the working gauge pattern
	osf(nof)	Element nof of an array that represents the frequency spectrum
	ospc(nof,noa)	Array element representing the directional distribution function at frequency of(nof) and direction oangle(noa)
	rname	Four-character string denoting reference gauge
	sfrq	Sampling frequency
	s6b	Mean wind speed at building anemometer
	s6m	Maximum wind speed at building anemometer
	s6s	Standard deviation of wind speed at building anemometer
	s9b	Mean wind speed at pier-end anemometer

Text	Appendix C	
	s9m	Maximum wind speed at pier-end anemometer
	s9s	Standard deviation of wind speed at pier-end anemometer
$S(f)$		Frequency spectrum
$S(f_n)$		Integrated frequency spectral density at frequency f_n
$S(\theta_m)$		Integrated direction spectral density at direction θ_m
$S(f_n, \theta_m)$		Frequency-direction spectral density at frequency f_n and direction θ_m
$S_{\min}(f_n)$		Minimum of $S(f_n, \theta_m)$ at frequency f_n
	thp	Peak direction of directional distribution at frequency fp
T_p		Spectral peak period
$T_{p,FD}$		Spectral peak period from the frequency at which the frequency-direction spectrum is a maximum
$T_{p,IFS}$		Peak period from the integrated frequency spectrum
w_m		m^{th} of a set of M weights used in the computation of incident and reflected energy
yymmdd		Mnemonic for date
$\Delta\theta$		Directional spread parameter
$\Delta\theta_n$		Directional spread parameter of a 180-deg directional distribution at frequency f_n
$\Delta\theta_{FDP}$		Directional spread parameter of the directional distribution at the peak frequency of a frequency-direction spectrum

Text	Appendix C	
$\Delta\theta_{IDS}$		Directional spread parameter of integrated direction spectrum
$\Delta\theta_{SW}$		Spectrally weighted directional spread parameter
θ_j		j^{th} direction of a set of M discrete directions
θ_m		m^{th} direction of a set of M discrete directions
θ_p		Peak direction
$\theta_{p,n}$		Direction of peak in directional distribution function at frequency f_n
$\theta_{p,FD}$		Direction at peak of frequency-direction spectrum
$\theta_{p,IDS}$		Direction at peak of integrated direction spectrum
$\theta_{p,SW}$		Spectrally weighted peak direction
$\theta_{25\%,n}$		Direction at which cumulative distribution function equals 0.25 at frequency f_n
$\theta_{50\%,n}$		Direction at which cumulative distribution function equals 0.50 at frequency f_n
$\theta_{75\%,n}$		Direction at which cumulative distribution function equals 0.75 at frequency f_n
ρ		Water density
χ		Reflection coefficient

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13. ABSTRACT *(Maximum 200 words)*

This report indexes parameters of and describes a means of access to 1.975 wind wave frequency-direction spectral observations obtained at the U.S. Army Engineer Waterways Experiment Station Field Research Facility from September 1993 to May 1994. An iterative maximum likelihood algorithm is used to estimate directional spectra using signals from a spatial array of 16 bottom-mounted pressure sensors in about 8 m of water, approximately 900 m offshore. Parameters include characteristic wave height, spectral peak frequency and corresponding peak period, peak wave direction, directional spread, and reflection coefficient. Time series graphs of these parameters, as well as local winds and currents, illustrate the salient climatology.

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